July 18, 1933. F. H. TREGO 1,918,299

VARIABLE FEED MECHANISM FOR TYPEWRITER CARRIAGES

Filed May 10, 1929 3 Sheets-Sheet 1

Fig. 1.

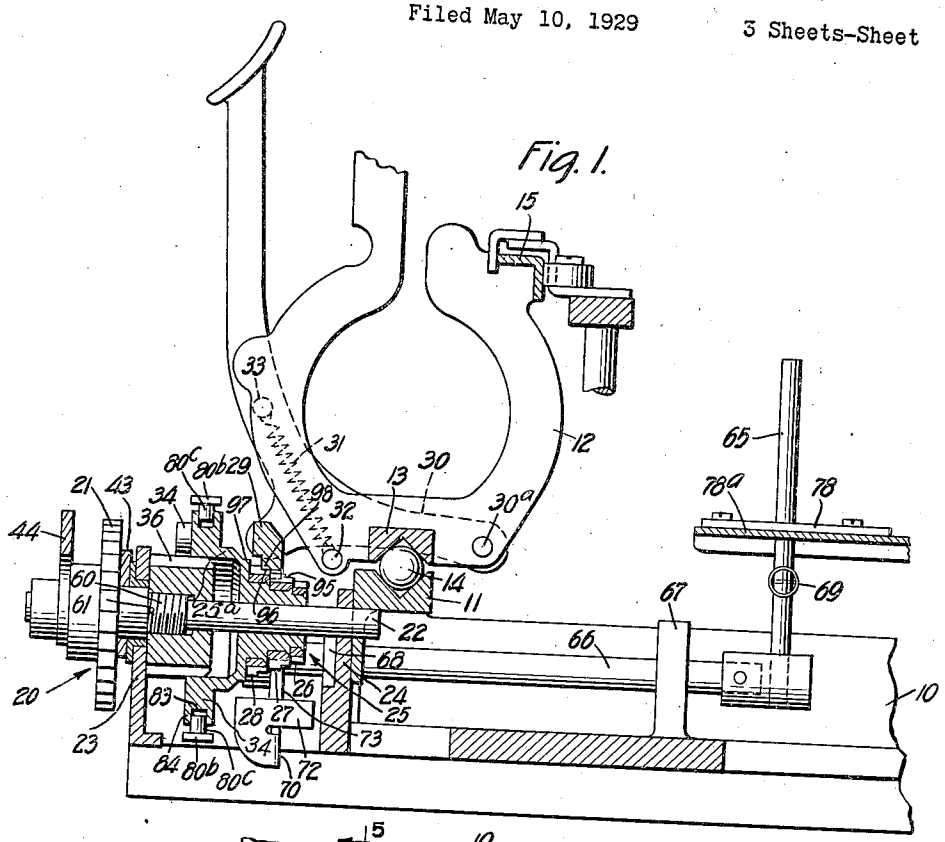
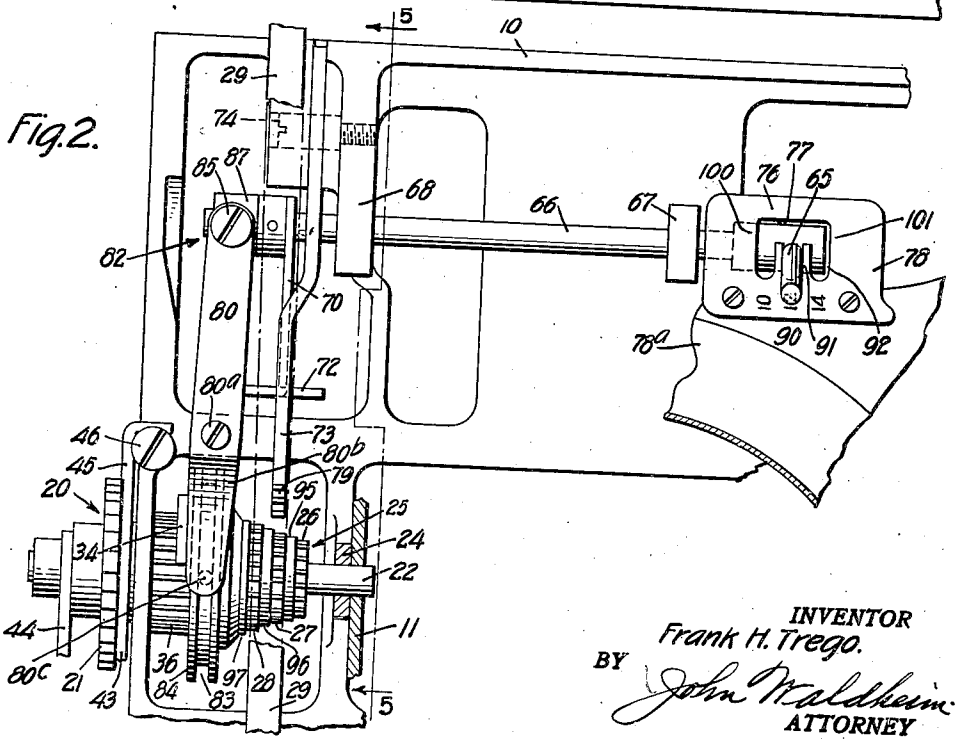


Fig. 2.



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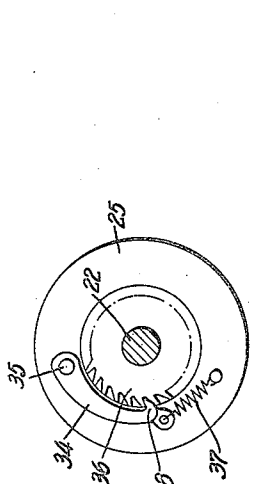


Fig. 4.

Fig. 3.

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VARIABLE FEED MECHANISM FOR TYPEWRITER CARRIAGES

Filed May 10, 1929 3 Sheets-Sheet 3

Fig. 5.

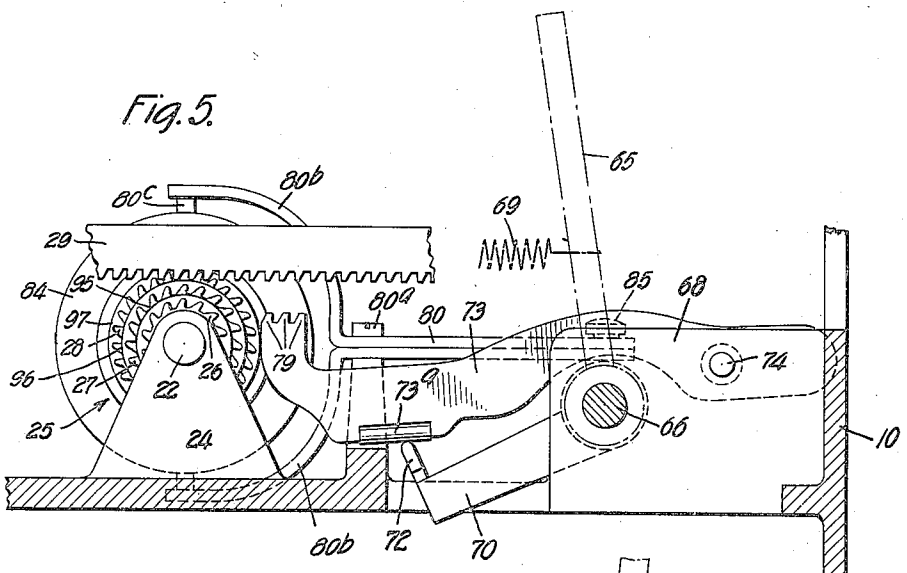


Fig. 6.

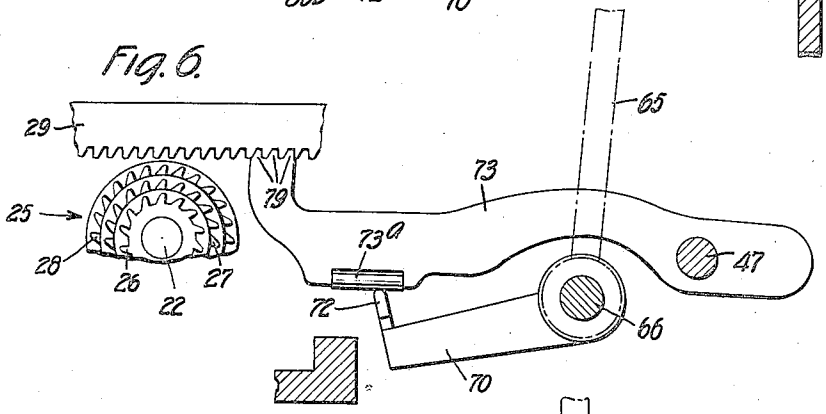
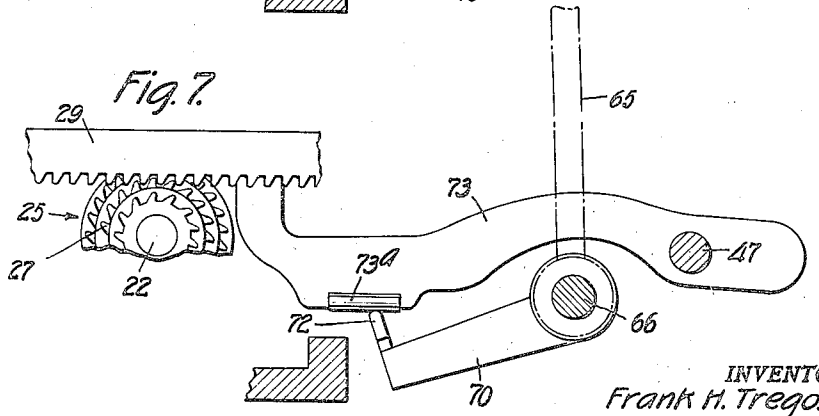


Fig. 7.



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UNITED STATES PATENT OFFICE

FRANK H. TREGO, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO RALPH C. COXHEAD CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

VARIABLE FEED MECHANISM FOR TYPEWRITER CARRIAGES

Application filed May 10, 1929. Serial No. 361,899.

This invention relates to improvements in typewriting machines and more particularly to means to effect variable letter spacing of the carriage.

Variable feed mechanism has been provided, in the past, including a plurality of racks on the carriage and a corresponding number of pinions which are shiftable on a shaft, transversely of the racks, to bring any one of the pinions into engagement with its corresponding rack. With such an arrangement difficulty is sometimes experienced, when shifting the pinions, of accidentally locking the carriage, due to the engagement of more than one pinion at a time and due to the action of the carriage propelling means.

An object of my invention is to provide a variable feed mechanism which is simple in construction, efficient in operation, and with which it is impossible to accidentally lock the carriage when shifting the mechanism to change the letter spacing of the carriage.

In carrying out the invention I provide a single rack, pivoted on the typewriter carriage, which may be caused to engage, selectively, with any one of a plurality of pinions of different sizes, associated with the escapement mechanism.

A feature of the invention relates to means for disengaging the rack from the active pinion and then effecting a relative shifting between the pinions and rack to bring the desired one of the pinions into cooperative relation with the rack.

Another feature of the invention relates to means to hold the carriage against the action of the carriage propelling means, while the changing of the feed is being effected so as to prevent the escape of the carriage while the rack is released from the pinion.

In the form of the invention herein illustrated I provide a finger-piece, on the machine frame, secured to a selector shaft by which a pinion element comprising the pinions may be moved axially back or forth on the escapement shaft through the medium of an intermediate lever connecting the shaft with the element or unit including all of the pinions. The shaft bearing the finger-piece has two movements, a rocking movement and a longitudinal movement. By rocking it by the finger-piece the shaft is released and the feed rack is swung, through a release arm, out of engagement with the pinion element. After the release of the rack from the pinion the selector shaft is moved longitudinally to actuate the pinion element and thus shift the desired pinion into cooperative relation with the rack. The shaft is then rocked back to normal, to swing the rack into engagement with the selected pinion, and is also locked against longitudinal movement to prevent accidental shifting of the pinion element.

Further features of the invention will hereinafter appear.

In the drawings:

Figure 1 is a vertical, central section taken on the line 1—1 of Figure 3.

Figure 2 is a top plan view of Figure 1, some of the parts being broken away.

Figure 3 is a rear elevation of the machine, partly in section, showing a portion of the carriage and other parts broken away.

Figure 4 is a detail rear view showing the pawl and ratchet of the escapement mechanism.

Figure 5 is a fragmentary front view, in section, the section being taken on the line 3—3 of Figure 2, and showing the parts including the feed rack and the rack release lever in their normal position; the machine being set for the greatest number of letter spaces.

Figure 6 is a view similar to Figure 5 and shows the rack lifted, clear of all of the pinions, prior to shifting them relatively to the rack.

Figure 7 is a view similar to Figure 6 but shows the rack lowered into engagement with one of the pinions and the release lever in position before it disengages the rack.

Similar reference characters refer to similar parts throughout the several views.

I have shown my invention applied to a machine known as the Varityper, formerly known as the Hammond typewriter. It includes a main frame 10 to which is secured a

guide rail 11 upon which a carriage 12 is mounted to travel back and forth transversely of the machine, the carriage being provided with a guide bar 13 which co-operates with the guide rail 11 through anti-friction rollers or balls 14. The carriage is further guided by means of a bar 15 at its upper end.

The carriage is urged in a letter feed direction by a carriage propelling means or spring drum 16 rotatably supported by a shaft 17 on the main frame 10, the spring drum being connected to the carriage by a draw band 18.

The letter feed movements of the carriage are controlled by escapement mechanism designated generally by the numeral 20. Said escapement mechanism includes a toothed escapement wheel 21 secured to a shaft 22 supported in bearings 23 and 24 on the main frame 10. Connected with the escapement wheel, in a manner hereinafter described, is a pinion element 25 including a sleeve 25^a and three pinions 26, 27 and 28 secured to said sleeve, any one of which pinions may be engaged by a rack 29 supported on the carriage 12. The rack 29 is secured to two arms 30, one at each end thereof, said arms being pivoted on studs 30^a secured to the carriage. The rack is held in engagement with the active pinion by one or more springs 31 each connected to a stud 32 on the carriage and a stud 33 on the rack supporting arm 30.

The pinion element 25 has a one-way driving connection with the escapement wheel 21, this connection including a pawl 34 pivoted at 35 on a flange 34^a, sleeve 25^a and a ratchet wheel 36 secured to the escapement shaft 22. A spring 37 (Fig. 4) holds the tooth 38 of the pawl 34 in engagement with the teeth of the ratchet wheel 36. It will thus be understood as the carriage is urged rightwardly in Figure 3, and leftwardly in Figure 5, by the spring drum, that the escapement wheel is urged to rotate by the rack 29 through the medium of the pinion element 25, pawl 34 and ratchet 36. The escapement wheel is normally held against rotation, however, by a loose dog 40, pivoted on a stud 41 of a frame 42 including two arms 43 and 44 pivotally supported on the escapement shaft 21. The arm 43 has an extension 45 engaging a stop 46 against which the extension is normally held by the action of the escapement wheel on the dog 40.

The feed, or in other words, letter spacing of the carriage is effected upon the depression of any one of the character keys or the space bar (not shown) through the rear end of the arm 47 (Fig. 3) which is moved downwardly and engages an inwardly projecting arm 48 to rock an escapement lever or dog rocker 49 about a pivot 50 against the action of a return spring 51. Said lever is provided with a slot 52 into which projects a pin 53 from the dog 40, so that as the lever 49 is actuated the dog 40 is swung out of engagement with the escapement wheel 21. A fixed dog 54 secured to the lever or dog rocker 49 is brought into the path of the teeth of said escapement wheel before the release of said wheel is effected. The loose dog is then carried upwardly past the previously engaged tooth of the escapement wheel. This upward movement of the loose dog is effected by the actuation of the printing hammer 55 which is connected to the frame 42 by a stud 56 carried by said frame and extending freely into an aperture in the printing hammer. Upon the release of the depressed key the arm 47 is returned to normal by a spring (not shown) thus permitting the dog-rocker 49 to return to normal under the action of the spring 51. The loose dog 40 is guided back into the path of the next succeeding tooth of the escapement wheel as its pin 53 travels up in the slot 52, and upon the return of the dog rocker the fixed dog is carried out of engagement with the escapement wheel thus permitting the completion of a letter space movement of the carriage.

The ratchet 36 may be secured to the escapement shaft 21 by screwing it on an enlarged portion 60 of said shaft and against a shoulder 61. The ratchet 36, which serves also as a nut, and the escapement wheel 21 are located at opposite sides of the post 23 and thus prevent axial movement of the escapement shaft 22. The pinion element or unit 25 is rotatably supported on said escapement shaft to permit the return of the carriage without disengagement of the rack from the pinion element, the pawl 34 riding freely over the teeth of the ratchet 36 during such return movement of the carriage. The pinion element is also slidably supported on the escapement shaft 21 to shift any one of the pinions 26, 27 or 28 into engagement with the rack according to the letter spacing desired of the carriage.

The pinions 26, 27 and 28 are arranged in step like relation, they vary in increasing diameters and they are of the same pitch as the rack 29. The pinions also vary respectively in size according to the number of teeth. Accordingly, for each letter space movement of the escapement wheel, which is constant, the angular distance of actuation of the pinions is the same, from which it follows that the linear distance which the rack is fed by the various pinions, at each letter space movement of the escapement wheel, increases as the diameters of the pinions increase.

In order to enable the pinions to be shifted unhindered the rack is first disengaged therefrom and swung about its pivots 30^a, clear of said pinions and transversely of the pinion axis. To this end there is provided a finger piece 65, secured to a shaft 66, sup-

ported in lugs 67 and 68 on the main frame 10. The shaft 66 may be rocked against the action of a return spring 69 in a clockwise direction (Fig. 5) by the finger-piece 65 to actuate an arm 70 secured to and near the rear end of the shaft 66. The arm 70 has an engaging portion 72 underlying an intermediate lever 73 to swing the latter about a pivot 74 on the machine frame 10. A suitable return spring (not shown) may, if desired, be provided for the lever 73. The free end of the intermediate lever 73 engages the rack 29 to swing it out of engagement with the pinions to the position in Figure 6. The releasing movement may be limited by a stop 76 forming the border of a longitudinal slot 77 in a plate 78 fastened to a cover plate 78[a] secured to the machine frame 10.

Provision is made to overcome the action of the spring drum, while the rack is released, to prevent the escape of the carriage. For this purpose the free end of the rack release lever 73 may be provided with one or more teeth 79 engaging between the rack teeth and thus prevent the escape of the carriage while the shifting of the pinions takes place.

To shift the desired pinion into co-operative relation with the rack 29 the finger-piece or handle 65 is moved lengthwise of the slot 77 to slide the shaft 66 axially back or forth in its bearings 67 and 68. A shift lever 80, pivoted at 80[a] on the main frame 10, is connected at 82 to the rear end of the shaft 66, in a manner hereinafter described, to swing the lever about its pivot 80[a]. The inner end of the lever 80 is provided with two arms 80[b] to extend partly around the pinion element 25 in opposite directions and each arm 80[b] is provided with a stud 80[c] projecting into an annular groove 83 formed in the periphery of a flange 84 of the pinion element 25. Thus, due to engagement of the studs 82 in the groove 83, the pinion unit 25 may be slid back and forth, to the desired position on the escapement shaft upon actuation of the lever 80, the annular groove permitting freedom of rotation of the pinion unit 25 with respect to the shift lever 80.

Due to the fact that the arm 70 is secured to the selector shaft 66 it moves transversely of the rack release lever 73, and that it should always be capable of engagement with said release lever to actuate the latter irrespective of the longitudinal position of the shaft 66, the engaging portion 72 of the arm 70 extends transversely under the release lever to engage it in any one of the positions of said arm.

To prevent undue rubbing of the lip 72 on the rack release lever 73, while the longitudinal movement of the selector shaft takes place, there may be provided on the release lever an anti-friction roller 73[a].

After the pinion corresponding to the desired letter spacing has been shifted into co-operative relation with the rack 29, the finger-piece 65 is swung in a counter clockwise direction in Figure 5, either manually or by the action of the return spring 69, to its normal position. Thus, the shaft 67 is rocked in the same direction to swing the arm 70 downwardly to effect the lowering of the feed rack, through the medium of the lever 73, into engagement with the selected pinion.

The connection at 82, between the selector shaft 66 and the pinion shifting lever 80, may include a shouldered screw 85 passing through an aperture 86 in the lever 80 and threaded into a collar 87 loosely supported on the shaft 66, the lower end of the screw having a reduced portion 88 which extends into an annular groove 89 formed in the shaft 66. Thus it will readily be understood that by means of this connection the lever 80 may be actuated by the shaft 66 to shift the pinion element and that the shaft is free to rock independently of said lever during the rack releasing operation.

To prevent accidental displacement of the pinion element on the escapement shaft from any one of its selected positions there may be provided suitable locking means which may be associated with the selector shaft 66. The locking means may include a series of slots 90, 91 and 92 in the plate 78 and forming branches extending transversely from the longitudinal slot 77. The handle 65 of the selector shaft 66 extends upwardly therefrom through the horizontally disposed locking plate and normally may engage in any one of the slots 90, 91 and 92 where it is held by the spring 69, thus locking the selector rod against longitudinal movement. Consequently the connected parts including the pinion element 25 are locked against accidental displacement. From the foregoing it will be understood that the unlocking of the selector rod takes place during the releasing of the rack which, it will be remembered, is effected by rocking the shaft 66 by the actuation of the handle to the slot 77.

Indices "10", "12" and "14" may be provided, one at each of the slots 90, 91 and 92, respectively, to facilitate the setting of the machine in accordance with the corresponding number of letter spaces desired to each inch of travel of the carriage. With the locking plate horizontally disposed, as above described, the indices may readily be observed.

The pinions 26, 27 and 28 are arranged in step like relation, and accordingly the rack 29 which is pivotally supported on the carriage, may be swung through varying distances, transversely of the pinion axis, towards said pinions, according to the pinion to be engaged.

Provision is made to limit the movement

of the rack, towards the pinions, in its various positions. This limiting means may include a plurality of stops in the form of annular shoulders 95, 96 and 97 associated respectively with the pinions 26, 27 and 28. A shoulder 98 on the rack 29, extending lengthwise thereof, cooperates with any one of the annular stops 95, 96 and 97, when the associated pinion is active, to maintain the proper meshing relation between rack and pinion.

To determine the extreme positions of the pinion element 25 there may be provided at the ends of the slot 77 stops 100 and 101 with which the handle 65 engages to arrest the selector shaft 66. As previously mentioned the pinion element 25 is connected to the shaft 66, accordingly said pinion element is arrested when the selector shaft is arrested and the selected one of the pinions is in register with the rack.

Briefly the invention includes the handle 65 which is normally held in one of the slots 90, 91 or 92 by the spring 69. In order to vary the letter spacing, say from twelve to ten to the inch, the handle is first moved out of the slot 91 to the longitudinal slot 77. This operation of the handle rocks the shaft 66 to effect the release of the carriage through the arm 70 and the rack release lever 73; the extent of release movement being determined by the stop 76 with which the handle 65 engages; the teeth 79 of the release lever engaging the rack teeth to prevent the escape of the carriage when the rack is released from the active pinion. While the handle is held against the stop 76 it is moved rearwardly of the machine in the slot 77 to the stop 100, thus actuating the lever 80 to shift the pinion element 25 to bring the pinion 28 into cooperative relation with the rack. The handle is then allowed to swing into the slot 90, opposite the index "10", under the action of the spring 69, to lower the rack into engagement with the selected pinion, thus changing the letter spacing of the carriage to ten spaces to the inch. When fourteen spaces to the inch are desired the handle 65 is shifted to the slot 92.

While certain preferred embodiments of the invention have been shown and described, it will be understood that changes in the form, arrangements, proportions, sizes and details thereof may be made without departing from the scope of the invention as defined in the appended claims.

I claim as my invention:

1. In a typewriting machine, the combination of a carriage, means including a shaft for controlling the feeding movements of said carriage, a sleeve mounted on said shaft to rotate therewith, pinions formed on said sleeve, said sleeve having an annular groove formed therein, a rack pivoted on the carriage and adapted to be engaged by and to engage the pinions selectively, said sleeve being supported on the shaft for axial movement with respect thereto, a selector shaft, an operating lever for the selector shaft, a guide plate to control the rocking and axial movements of the operating lever, an actuating lever mounted on the selector shaft, a release lever engaged by the actuating lever, means on the release lever for engaging the rack to move the latter out of engagement with the pinions, a shift lever, a connection between the selector shaft and shift lever for transmitting the axial movement of the selector shaft to the shift lever, and fingers on the shift lever engaging in the groove on the sleeve to effect a shifting of said sleeve to carry the desired one of the pinions into co-operative relation with said rack.

2. In a typewriting machine, the combination of a carriage, means including a shaft for controlling the feeding movements of the carriage, a plurality of gears carried by the shaft to rotate therewith, a rack carried by the carriage to be engaged by and to engage the gears selectively, said gear being supported on the shaft with capacity for axial movement with respect thereto, means to pivotally support the rack upon the carriage, a selector shaft, means to impart axial and rocking movement to the shaft, means to transmit the axial movement of the shaft to move the gears axially, means to cause the rocking movement of the shaft to move the rack with respect to the axis of the first named shaft, a slotted guide plate to control the movements of the selector shaft moving means, and means to urge the selector shaft moving means into the slots of the guide plate.

3. In a typewriting machine, the combination of a carriage, means including a shaft for controlling the letter space movements of the carriage, a plurality of gears, means to connect the gears to the shaft to rotate therewith, a rack carried by the carriage and adapted to be engaged by and to engage the gears selectively, said gears being supported with capacity for axial movement with respect to the shaft, means to support the rack upon the carriage with capacity for movement with respect to the axis of the gears, a selector shaft mounted for axial and rocking movement, means to cause the axial movement of the shaft to move the gears axially, means to cause the rocking movement of the shaft to move the rack with respect to the axis of the first named shaft, and means normally urging the selector shaft moving means in a direction to permit the rack to engage a gear.

4. In a typewriting machine, the combination of a carriage, means including a shaft for controlling the letter space movements of said carriage, a plurality of gears to vary the feed of said carriage, means to connect

the gears to the shaft to rotate therewith, a rack carried by the carriage and adapted to be engaged by the gears selectively, said gears being supported with capacity for axial movement with respect to the shaft, means to support the rack upon the carriage with capacity for movement thereof with respect to the axis of the gears, a selector shaft, means to impart axial and rocking movements to the shaft, means between the selector shaft and gears to transmit the axial movement of the shaft to move the gears axially, and means to cause the rocking movement of the shaft to move the rack with respect to the axis of the gears.

5. In a typewriting machine, the combination of a carriage, means including a shaft for controlling the letter feed movements of the carriage, a plurality of gears having a common axis and operatively connected to the shaft to rotate therewith and capable of axial movement, a rack carried by the carriage adapted to be engaged by the gears selectively and mounted for movement transversely of the axis of the gears, a selector shaft, means to move the selector shaft axially, and means between the selector shaft and the gears to transmit the axial movement of the selector shaft to the gears to move them axially to shift them with respect to the rack.

6. In a typewriting machine, the combination of a carriage, carriage feed mechanism including a unit having a plurality of gears, a rack carried by the carriage and adapted to be engaged by the gears selectively, means to mount the gears for axial movement, means to mount the rack upon the carriage to move into and out of meshing engagement with the gears, and common means to move the rack with respect to the gears and subsequently move the gears axially to effect a desired selection with respect to the rack to vary the letter feeding of the carriage.

7. In a typewriting machine, the combination of a carriage, mechanism for controlling the letter feed movement of said carriage, said mechanism including a plurality of gears, a rack carried by the carriage and adapted to be engaged by the gears selectively, said gears being supported on said shaft with capacity for axial movement, means to support the rack upon the carriage with capacity for movement with respect to the axis of the gears, and means to move the rack with respect to the gears, said last named means being also effective to move the gears axially to effect a selection in accordance with the desired letter spacing.

8. In a typewriting machine, the combination of a carriage, escapement mechanism including a plurality of gears, a shaft upon which the gears are slidingly supported, a rack pivoted on the carriage and adapted to engage the gears selectively, a finger-piece, means under the control of said finger-piece to move said rack in a plane transversely to the axis of the gears into and out of meshing engagement with the gears, means under the control of said finger-piece, to move the gears axially on said shaft selectively to bring any desired gear into the plane of said rack and thus permit of an intermeshing of the rack with the selected gear when the rack is moved back to its active position, and a pawl and ratchet connection between said gears and said shaft to effect a one-way driving connection between the carriage and the escapement mechanism.

9. In a typewriter, the combination of a carriage, mechanism to vary the feed of the carriage, said mechanism including a gear set comprising a plurality of gears having different pitch diameters, a single rack on the carriage to engage any one of the gears to feed the carriage, and a single manually actuated control operatively connected to both the gear set and the rack for sequentially moving the rack from the gear set, shifting the gear set to bring another gear into co-operative relation with the rack and for replacing the rack into mesh with the selected gear.

10. In a typewriter, a variable feed letter spacing mechanism including a single rack on the carriage, a plurality of gears, each having a different pitch diameter, and a single control mechanism for selectively connecting any one of said gears with said rack.

11. In a typewriter, a variable spacing carriage feed mechanism including a single rack on said carriage, a plurality of gears adapted to be engaged by the rack, means for disengaging the rack from the gears, means to hold the carriage against displacement in a disengaged position of the rack, and means to move any one of the gears to a selected position while the rack is disengaged.

12. In a typewriter, a variable spacing carriage feed mechanism including a single rack on said carriage, a plurality of gears adapted to be engaged by the rack individually to vary the letter feed movement of the carriage, a lever for disengaging the rack from the gears, teeth on the lever to engage the teeth of the rack to hold the rack against axial displacement in a disengaged position, and manual means to actuate the lever and shift one of the gears into meshing relation with the rack.

13. In a typewriting machine, the combination of a carriage, escapement mechanism for said carriage, said escapement mechanism including a plurality of pinions, said pinions being of the same pitch and having different numbers of teeth, a single rack on said carriage, and selecting means including a single finger-piece to swing said rack and slide said pinions to effect co-operation of

said rack with any one of the pinions to vary the letter spacing of the carriage.

14. In a typewriting machine, the combination of a carriage, escapement mechanism for said carriage, said escapement mechanism including a plurality of pinions, said pinions being of the same pitch and having different number of teeth, a single rack on said carriage, a main frame on which the carriage travels, and means supported on the main frame to actuate the rack to disengage it from the pinion, then selecting a pinion and subsequently effecting engagement of the rack with the selected pinion, to vary the letter spacing of said carriage.

15. In a typewriting machine, the combination of a carriage, a main frame to support said carriage, escapement mechanism for said carriage, said escapement mechanism including a plurality of pinions, a rack on said carriage to engage said pinions one at a time to effect variable letter spacing of the carriage, selecting means to effect a relative shifting between the rack and the pinions, and means on the main frame to actuate and disengage the rack from the active pinion prior to the shifting operation, said means being also effective to hold the carriage while the rack is disengaged.

16. In a typewriting machine, the combination of a carriage, carriage propelling means, escapement mechanism for said carriage, said escapement mechanism including a plurality of pinions, a rack on said carriage to engage said pinions one at a time to effect variable letter spacing of the carriage, means to effect a relative shifting between the rack and the pinions, means to disengage the rack from the active pinion prior to the shifting operation, and means to hold the carriage against the action of the propelling means while the rack is released from said pinions.

17. In a typewriting machine, the combination of a carriage, means to propel said carriage, escapement mechanism to effect letter space movements of said carriage, said escapement mechanism including a pinion element, a rack on said carriage co-operating with said pinion element, means to release the rack from the pinion and then effect a relative shifting between the rack and the pinion element to change their co-operation to vary the letter spacing of said carriage, and means to overcome the action of the carriage propelling means during the release of the rack from the pinion.

18. In a typewriting machine, the combination of a carriage, propelling means for said carriage, escapement mechanism for said carriage, a plurality of pinions, a rack element to co-operate with said pinions according to the desired letter space, means to release the rack element from the pinions and to cause a relative shifting between the rack and pinions, and means to overcome the action of the propelling means while the release and relative shifting is taking place.

19. In a typewriting machine, the combination of a carriage, propelling means therefor, escapement mechanism, said escapement mechanism including a plurality of pinions, a rack on said carriage to engage any one of the pinions, selecting means, a main frame on which the carriage travels, a release lever pivoted on the main frame and operable by the selecting means to swing the rack out of engagement with the pinion, teeth on said release lever to engage with the rack to hold the carriage against the action of the carriage propelling means, and means operable by the selecting means to shift the desired pinion into co-operative relation with said rack.

20. In a typewriting machine, the combination of a carriage, propelling means therefor, escapement mechanism, said escapement mechanism including a plurality of pinions, a rack on said carriage to engage any one of the pinions, a main frame on which the carriage travels, selecting means on the main frame, including a rock shaft, an arm on said rock shaft, a release lever pivted on the main frame and operable by the arm of the selecting means to swing the rack out of engagement with the pinion, teeth on said release lever to engage with the rack to hold the carriage against the action of the carriage propelling means, said rock shaft being movable axially, means operable by the axial movement of said shaft to shift the desired pinion into co-operative relation with said rack, and an engaging portion on said arm extending crosswise of the release lever to engage the latter in any position of the selecting means.

21. In a typewriting machine, the combination of a carriage, escapement mechanism including a plurality of pinions to effect variable letter spacing of the carriage, a rack to engage any one of said pinions, means to release the rack from the active pinion, selecting means to effect a relative shift between the rack and the pinions, a device to operate the rack releasing means and the selecting means, a stop for said device to limit the movement of the rack in its released position, and a stop to co-operate with said device to determine the positions of the selecting means.

22. In a typewriting machine, the combination of a carriage, escapement mechanism for said carriage, said escapement mechanism including a plurality of pinions to effect variable letter spacing of the carriage, a rack on said carriage, means to effect a relative shifting between the rack and the pinions in accordance with the desired letter spacing of the carriage, means to release the rack to facilitate the relative shift-

ing, and means to compel the release of the rack pior to said relative shifting.

23. In a typewriting machine, the combination of a carriage, propelling means therefor, variable spacing mechanism for said carriage, said spacing mechanism including a rack unit, and a gear unit co-operating therewith, means to effect a disengagement between the rack unit and the gear unit so that a relative shifting may be effected according to the desired letter spacing, and means to hold the carriage against the action of the propelling means while the rack unit and the gear unit are disengaged.

24. In a typewriting machine, the combination of a carriage, propelling means therefor, variable spacing mechanism for said carriage, selecting means to set the variable spacing mechanism according to the desired letter spacing, means to release the carriage from the escapement mechanism while the variable spacing mechanism is being set, and means to hold the carriage against the action of the propelling means when the selecting means is active.

25. In a typewriting machine, the combination of a carriage, escapement mechanism therefor, said escapement mechanism including means settable to effect variable feeds of the carriage, and a rock-shaft operable to effect the release of said carriage from the escapement mechanism prior to a selecting operation of the shiftable means, said rock-shaft being operable longitudinally to effect the setting of the variable feed means.

26. In a typewriting machine, the combination of a carriage, escapement mechanism therefor, said escapement mechanism including means settable to effect variable feeds of the carriage, means including a rock-shaft operable to effect the release of said carriage from the escapement mechanism prior to a selecting operation of the shiftable means, said rock-shaft being operable longitudinally to effect the setting of the variable feed means, and means to lock the carriage before the rack is entirely released from the escapement mechanism.

27. In a typewriting machine, the combination of a carriage, variable feed escapement mechanism including a rack element and a pinion element, selecting means to effect a relative shifting between the rack element and the pinion element to change the feed of the carriage, said selecting means including a shaft, means connecting said shaft with one of said elements, a handle on said shaft, and a plate having notches therein in which the handle engages to lock it in any one of a plurality of positions, said shaft being movable about its axis to unlock it, and then movable longitudinally to effect a selecting operation.

28. In a typewriting machine, the combination of a carriage, variable feed escapement mechanism including a rack element and a pinion element, selecting means to effect a relative shifting between the rack element and the pinion element to change the feed of the carriage, said selecting means including a shaft, means connecting said shaft with said pinion element, a handle extending upwardly from said shaft and rigidly secured thereto, a horizontally disposed locking plate having notches therein in any one of which said handle may engage, said plate having also an elongated slot from which the notches extend, said handle being movable out of any one of the notches into said slot and then movable lengthwise of said slot to move the shaft axially to shift the pinion element to change the feed of the carriage, and stops formed by the ends of said slot to limit the movement of said shaft in its two extreme positions.

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