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PATENTED NOV. 19, 1907.

W. P. KIDDER & C. W. SPONSEL.

TYPE WRITING MACHINE.

APPLICATION FILED OCT. 20, 1906.

3 SHEETS—SHEET 1.

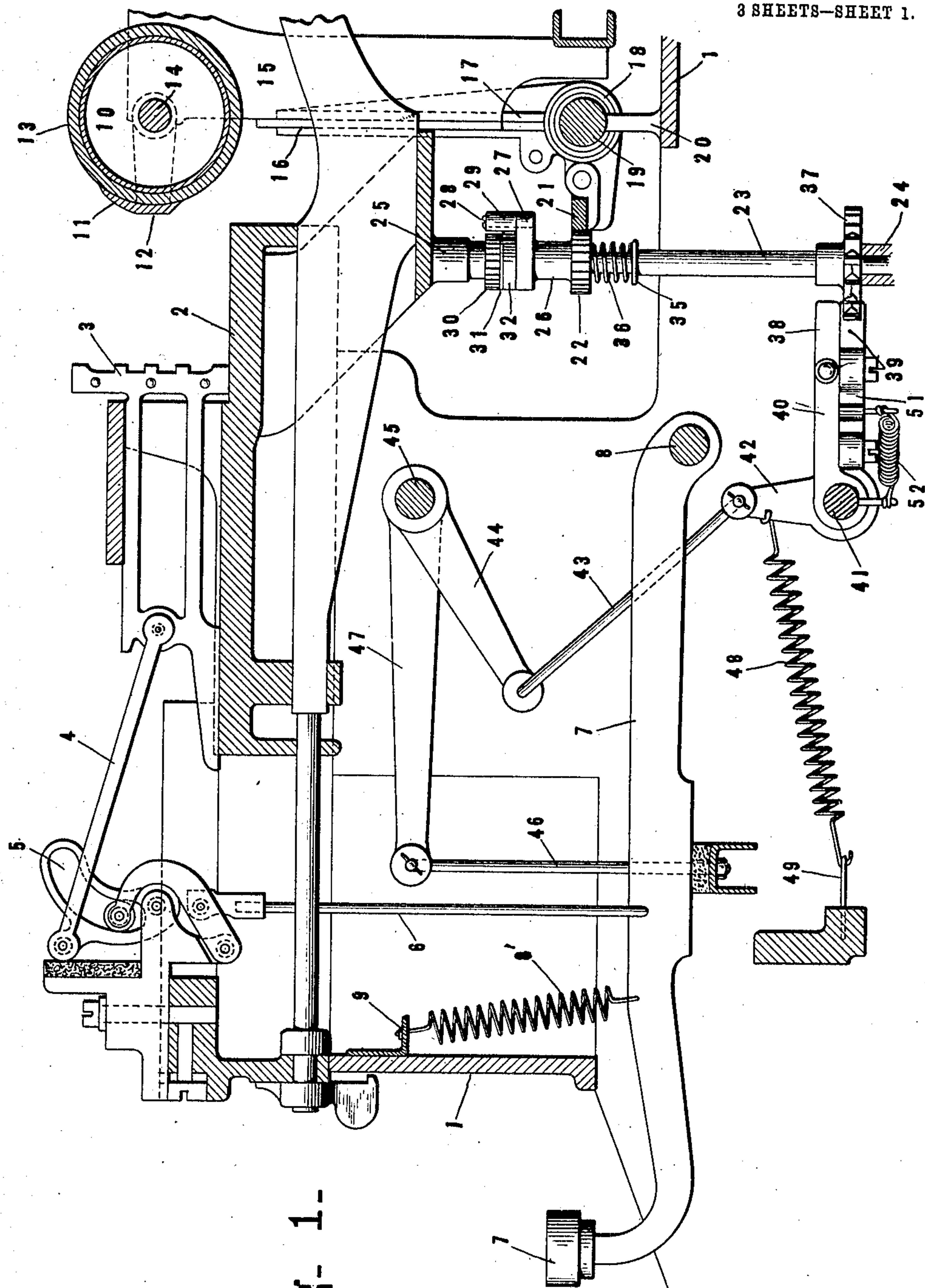


Fig. 1-

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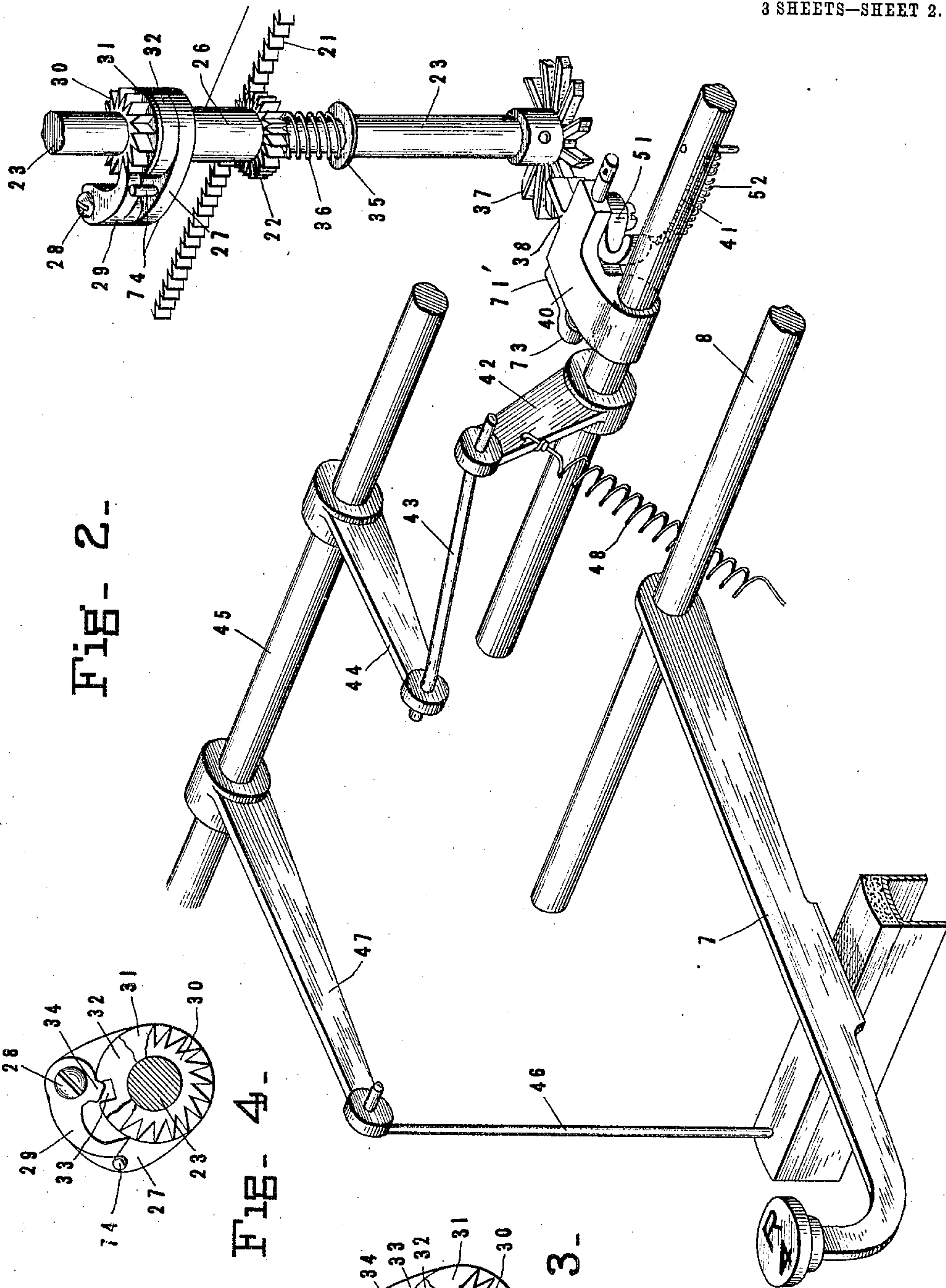
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3 SHEETS—SHEET 2.



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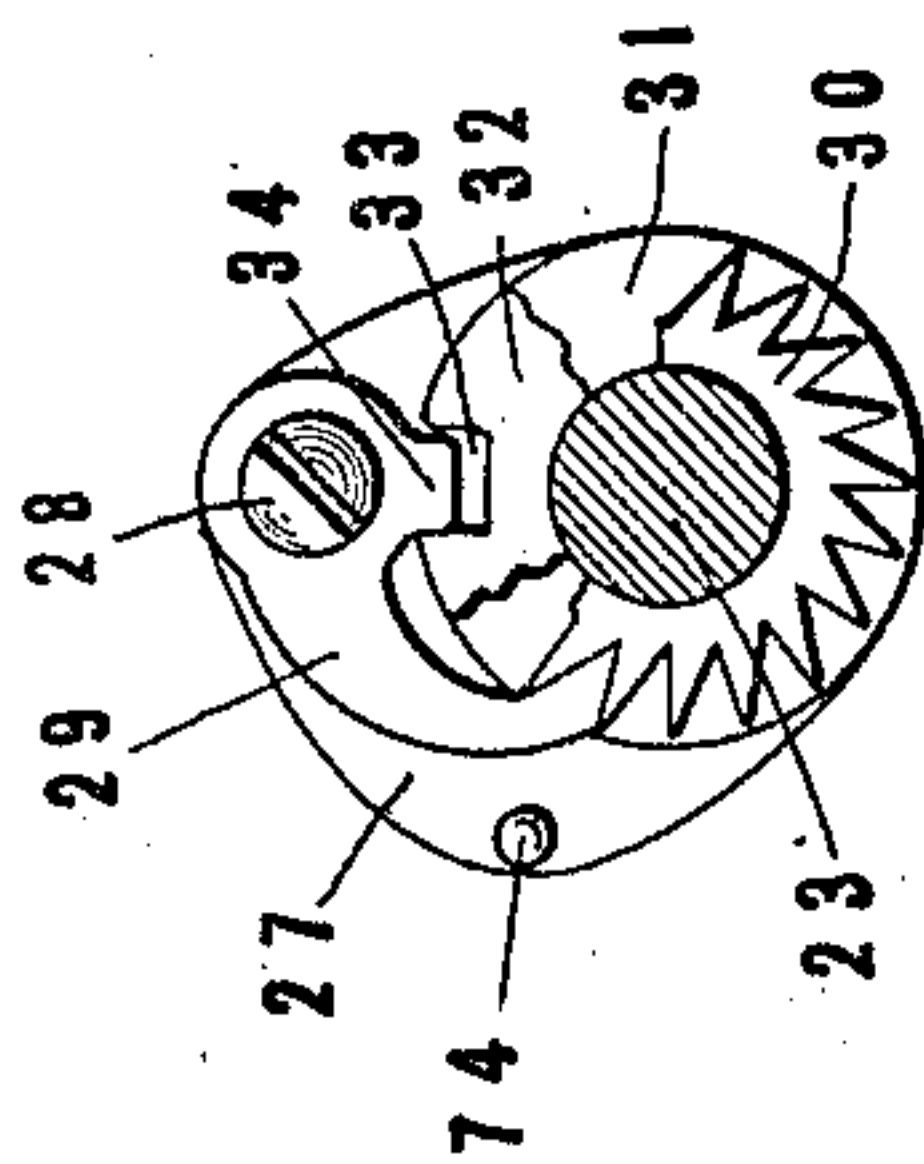


Fig. 3-

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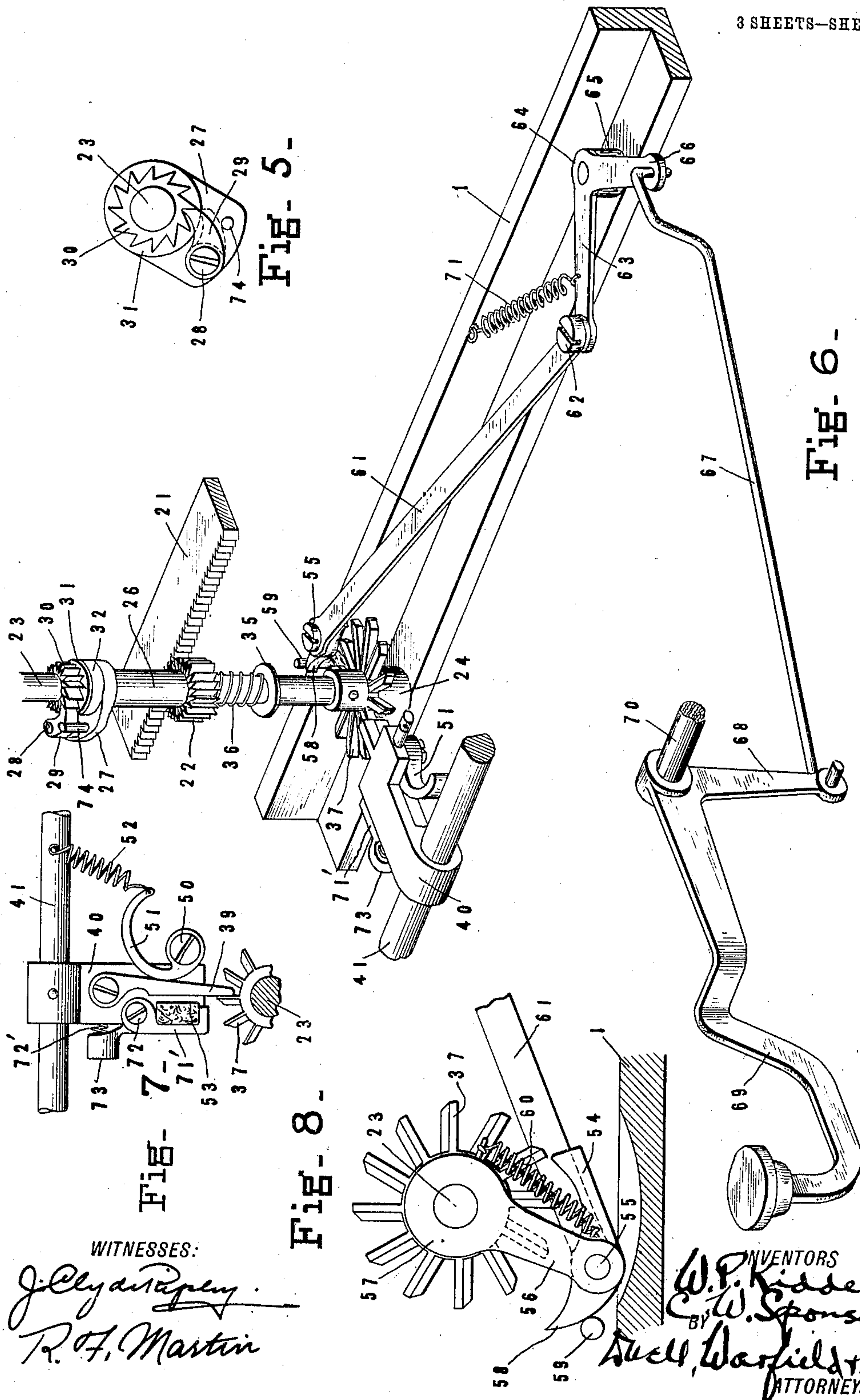
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APPLICATION FILED OCT. 20, 1906.

3 SHEETS—SHEET 8.



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# UNITED STATES PATENT OFFICE.

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## TYPE-WRITING MACHINE.

No. 871,281.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed October 20, 1906. Serial No. 339,799.

*To all whom it may concern:*

Be it known that we, WELLINGTON P. KIDDER and CHARLES W. SPONSEL, residing at Boston, in the county of Suffolk, State of Massachusetts, and Hartford, in the county of Hartford and State of Connecticut, respectively, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to typewriting machines, and more particularly to the feeding mechanism for the carriages thereof.

One of the objects of our invention is to reduce to a minimum the production of noise incident to the operation of a typewriting machine.

Another object is to provide a construction whereby the carriage, after a line is completed, may be returned to commence a new line of writing without the usual disagreeable noise produced by the pawl and ratchet mechanism employed in some types of machines and without its being necessary to throw the feed rack and the feed pinion out of engagement with each other during such return movement.

A further object hereof is to provide improved mechanism whereby the carriage may be moved backward or back spaced at will at any point in a line of writing.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the embodiment hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein is shown one of various possible embodiments of my invention, Figure 1 is a view in side elevation, partly in section, showing one form of typewriting machine equipped therewith. Fig. 2 is a view in perspective showing certain of the operative parts of the machine. Fig. 3 is a top plan view partly in section showing a detail of construction. Fig. 4 is a similar view showing the positions assumed by certain of the parts while the carriage is being returned to initial position.

Fig. 5 is a view in elevation showing a detail of construction. Fig. 6 is a view in perspective showing the mechanism for back spacing the carriage. Fig. 7 is a view in elevation showing the escapement wheel and the back spacing pawl when the parts are in normal position. Fig. 8 is a similar view of the escapement mechanism.

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

In order that the important objects of our invention may be more readily grasped, it may here be noted that the clicking of pawl and ratchet mechanism, or the noise created by other escapement devices employed in connection with the feeding mechanism of carriages of typewriters, whenever they are returned to begin a new line, is a constant source of annoyance and especially is this the case in machines of the type herein shown wherein a substantially noiseless operation of the remaining operative mechanism of the machine has been secured, as a silent operation of the other mechanism renders any noise produced by the escapement mechanism more noticeable. We have therefore found it desirable to provide a construction wherein the carriage, although the feed pinion thereof is constantly in mesh with the feed rack thereof, may be returned to its initial or line-commencing position without the production of any noise whatever, or whereby the same may be readily set back one or more letter spaces at will, and it should be apparent from the following description in detail of the structural features which constitute our invention that we realize these and other highly important ends through the provision of exceedingly simple and efficient mechanism.

Referring now to the drawings, wherein one adaptation of our invention is shown applied to a noiselessly operating typewriter, 1 designates the framework of the machine, the upper portion of which carries a table or bed 2 across which the type-carrying members, one of which is shown at 3, are adapted to be projected. The type-carrying members are suitably grouped upon bed 2 so as to be projected against a common point on the platen, and each of said type-carrying members is connected by means of a link 4 with suitable actuating devices here-



in shown as comprised by toggle mechanism 5, connected by means of a rod or link 6 with a key-lever 7 fulcrumed upon a rod 8 which extends transversely of the machine and is fastened at either end in the end walls thereof. A suitable spring 8' is connected with each of the key levers and extends upward therefrom and is connected at its upper end, as at 9, with the framework of the machine.

The platen 10 is shown in the present instance as constituted by a bar or plate 11 formed with a plane impression surface 12, and has its rear surface curved to correspond with the curved periphery of the paper roll 13 against which said platen normally rests. The paper roll is carried upon a shaft 14 which is journaled at either end in the platen frame 15, said platen frame being mounted to be shifted vertically in ways 16 provided in members 17 erected upon either end of a yoke 18. Yoke 18 rides upon a stationary rail 19 mounted upon standards 20 erected upon the framework of the machine and is urged to movement from right to left by the usual carriage propelling spring, not herein shown.

Pivotaly mounted upon yoke 18 is the usual carriage feedrack 21, which may, if desired, be rigidly connected with said yoke, and meshing with this rack is a feed pinion 22, said feed pinion being loosely carried upon a shaft 23 journaled at either end in suitable bearings provided in the framework of the machine, as at 24 and 25 respectively. Feed pinion 22 is provided with an upwardly extending hub 26 having a flanged portion 27 which carries a rigidly mounted stud, shown in the present instance as being constituted by a screw 28. Upon this stud is pivotally mounted a pawl 29 which engages a ratchet wheel 30 fixedly mounted upon shaft 23. Immediately beneath ratchet wheel 30 and encircling shaft 23 is a friction washer 31 preferably constructed of rawhide, although any suitable friction-creating material may be used in this relation, and on shaft 23, between this washer and the flanged portion 27 of feed pinion 22, is interposed a loose collar 32. This collar is provided with a jog or notch 33 the walls of which take loosely about a tooth or lug 34 extending laterally from pawl 29, as clearly shown in Fig. 3 of the drawings. Encircling shaft 23 and resting upon a shoulder 35 formed thereon is an extensile spring 36 engaging at its upper end feed pinion 22 and urging the same in an upward direction in order to hold the flange portion 27 in engagement with collar 32 and force said collar against washer 31, which in turn is maintained in engagement with the lateral surface of ratchet wheel 30.

An escapement wheel 37 is fixedly mounted upon shaft 23, and with this escapement wheel coöperates a fixed holding dog 38 and a swinging feed dog 39 mounted upon rocker

member 40 carried by a shaft 41 which extends transversely of the machine and is journaled in the end walls of the framework thereof. Shaft 41 carries an arm 42 connected, as by means of a link 43, with a similar arm 44 extending from the universal rocker shaft 45 which extends transversely of the machine and is journaled in the end walls thereof. Universal shaft 45 is actuated by the key levers and spacing mechanism through the instrumentality of a universal bail which extends beneath the key and spacing levers and is connected by means of a link or rod 46 with rocker arms 47 extending forwardly from universal shaft 45.

The parts next above described are maintained in the position shown in Fig. 2, with the feed-dog 39 in engagement with escapement wheel 37, and normally restraining a rotative movement thereof, by means of a retractile spring 48 connected with arm 42 of shaft 41 and also connected with a fixed part of the machine at 49.

In order to secure a substantially noiseless operation of the escapement mechanism during the letter feeding movement of the carriage, we pivot upon a stud-screw 50, threaded into rocker member 40, a wiper cam 51. Feed dog 39 is forced by escapement wheel 37 against wiper cam 51, as shown in Fig. 7 of the drawings, said cam, when in the position shown, constituting a stop which, through said dog, restrains the escapement wheel against rotative movement, to which it is constantly urged by the power-driven carriage. Cam 51 is connected, by means of retractile spring 52, with shaft 41 and is urged to pivotal movement thereby in a direction contrary to that urged by feed dog 39, and when rocker member 40 is rocked to carry the holding dog 38 into engagement with a tooth of the escapement wheel, as when it is desired to afford a feed of the carriage in the letter spacing direction, spring 52, through cam 51, swings dog 39 against a cushioned stop 53 in position to engage with the oncoming tooth of the escapement wheel. During the letter spacing movement of the carriage, which is permitted by the engagement of dog 39 with such preceding tooth of the escapement wheel, as when rocker member 40 is rocked to effect such engagement, said escapement wheel will force feed dog 39 against wiper cam 51, which will swing upon its pivot to the position shown in Fig. 7 of the drawings against the tension of spring 52 and thus effect a silent arresting of said feed dog. Inasmuch as the curved surface of the cam is at all times in contact with feed dog 39, no concussion or impact of the moving parts occurs and the swinging movement of said dog is yieldingly opposed and finally arrested in a silent manner, as when the cam is swung to the position shown in the drawings.

In order to effect a step by step backward



feed of the carriage, we provide a pawl 54 to engage directly the teeth of escapement wheel 37, and rotate the same in a reverse direction, thereby, through shaft 23, causing a reverse rotation of feed pinion 22, which co-acts with the carriage feed rack and returns the carriage one or more steps toward initial position against the influence of its propelling spring. Pawl 54 is pivotally mounted upon a stud screw 55, carried upon an arm 56 which extends from a collar 57 mounted loosely upon shaft 23 beneath the escapement wheel and said pawl is provided with a curved extension or tail piece 58 which is adapted to be engaged by a post 59 extending upwardly from the framework of the machine and held normally thereby out of the path of the teeth of the escapement wheel. When the parts are in normal position, pawl 54 is urged toward escapement wheel 37 by means of a retractile spring 60, which connects the same with a projection extending from collar 57 so that when arm 56 of said collar is swung, as by means of a link 61 which is pivotally connected therewith, retractile spring 60 will carry the pawl into engagement with a tooth of the escapement wheel, the curved surface of extension 58 of said pawl riding along post 59 to permit such swinging movement. Link 61 is connected, by means of stud-screw 62, with arm 63 of a bell-crank lever 64 which is pivotally mounted at 65 in the framework of the machine, the other arm 66 of said lever being connected by means of a link 67 with an arm 68 of a finger lever 69 journaled upon a rod 70 in the front portion of the framework of the machine. Arm 63 of said bell-crank lever is connected with the framework as by means of a retractile spring 71, such spring operating to hold the parts in the position shown in Figs. 6 and 7 of the drawings, the pawl, as shown, being held out of the path of the teeth of the escapement wheel.

In order that feed dog 39 may clear the teeth of the escapement wheel during the reverse rotation thereof, as when pawl 54 is actuated to back-step the carriage, stop 53 is carried upon a swinging block 71' pivotally mounted upon stud screw 72 upon rocker member 40, said block being held in position to enable stop 53 to arrest the normal swinging movement of feed dog 39 by means of an extensile spring 72' interposed between said rocker member and an arm 73 which extends rearwardly from said block. It will be understood that this construction enables dog 39 to swing clear of the teeth of the escapement wheel and thus permit a reverse rotation of the escapement wheel.

Having thus described the structural features constituting this embodiment of my invention, the operation thereof may now be understood. With the parts in the normal position shown in the drawings, pawl 29 will

engage with one of the teeth of ratchet wheel 30, as shown in Fig. 2 of the drawings, which will thereby be prevented from rotating independently of shaft 23 when the carriage is being fed for letter spacing. Shaft 23, carrying the escapement wheel 37, with which the swinging escapement dog 39 normally engages, will, by means of pinion 22, which meshes with feed rack 21 of the carriage, maintain the carriage stationary at any point in its range of movement, through the above-described train of mechanism, after each actuation of the escapement mechanism. When rocker member 40 is swung, as when a key lever or the spacing mechanism is actuated, this member will through feed dogs 38 and 39 afford a feed of the carriage under the influence of its driving spring in the usual manner. The escapement wheel being free to rotate through a distance equal to the space separating adjacent teeth, rack 21 turns pinion 22 which, through pawl 29 and ratchet wheel 30, compels a rotative movement of shaft 23 and the escapement wheel thereon. The rotation of escapement wheel 37 swings dog 39, and such swinging movement causes cam 51 to swing upon its pivot to the position shown, where it silently arrests the pivotal movement of said dog and likewise the movement of the carriage through the interconnected train of mechanism above described. When, however, the carriage is moved back toward its initial position, the starting of such movement, as by the hand of the operator engaging the carriage, will, by means of rack 21, first rotate feed pinion 22 slightly, and pawl 29, which is carried by the flanged portion 27 of said feed pinion, will ride backward in contact with the face of one of the teeth of ratchet wheel 30. Collar 32, carried loosely upon shaft 23 and resting upon flanged portion 27 of feed pinion 22, will also tend to be rotated in a reverse direction, but such rotative movement will be frictionally resisted by means of the engagement of said collar with the friction washer 31 interposed between the same and the lateral surface of ratchet wheel 30. Inasmuch as a greater frictional resistance or drag will be effected between collar 32 and friction collar 31 than between said collar and the flanged portion 27 of feed pinion 22, the rotative movement of collar 32 is momentarily arrested. Lug 34 of pawl 29 engaging the walls of dog 33 of collar 32 will also be held momentarily against movement, but as the pivot of said pawl is carried by the flanged portion 27 of pinion 22 and rotated therewith, the pawl will be tripped or swung from engagement with the teeth of ratchet wheel 30 so as to clear the same while the feed pinion is being rotated in a reverse direction, the outward swinging movement of the pawl being limited by its engagement with a fixed post 74 erected upon flanged portion 27.



Subsequent to this engagement and during the returning movement of the carriage, collar 32 will be compelled to rotate with feed pinion 22, owing to the limiting of the outward swinging movement of pawl 29 by post 74, such engagement establishing a positive connection between the pawl and feed pinion. As the pawl rides free of the ratchet wheel, the carriage may be returned without a clicking of the parts and therefore silently. The return of the carriage also takes place without effecting a reverse movement of the escapement wheel, and it will of course be understood that at whatever position the carriage is allowed to rest during such returning movement, the friction drag exerted upon collar 32 will operate in a reverse direction, thereby, through the engagement of said collar with said pawl, swinging the same into engagement with its ratchet wheel, thus holding the carriage in a stationary position. In case the operator should desire to back-space the carriage through any desired number of letter-space distances in order to carry the paper to a desired point for the insertion of a character, it is merely necessary to depress finger lever 69, which will, through the mechanism above described, cause pawl 54 to engage with the teeth of escapement wheel 37 and turn it in a reverse direction. This reverse rotation of the escapement wheel likewise effects a turning of pinion 22 in a reverse direction; and inasmuch as said pinion engages the feed rack on the carriage, the carriage will be moved from left to right, or in a direction contrary to its ordinary letter-feeding movement through a distance of one letter space at each depression of finger key 69. During the reverse rotation of the escapement wheel, the yielding of block 71, as when feed dog 39 is carried into engagement therewith, will permit said dog to clear the teeth of the ratchet wheel, and it will be understood that said pawl will snap over the back of each tooth ready to be engaged by the face thereof to again hold the carriage stationary with the coöperation of cam 51. Cam 51, as above described, follows the swinging movement of feed dog 39 and is always in frictional engagement therewith, thus arresting its movement in one direction without impact or concussion and therefore silently; and said pawl is also arrested silently when swung in the opposite direction into position to engage the oncoming tooth of the escapement wheel by means of the cushioned stop 53.

It will thus be seen that we have provided mechanism wherein are realized, among others, all the objects and ends sought to be attained, such mechanism insuring that the carriage shall be fed in a letter spacing direction in an absolutely silent manner, and that the same may likewise be returned to initial or line-commencing position. The mechanism

employed for moving the carriage step by step in a reverse direction is simple and effective, and, moreover, is capable of operating in a substantially noiseless manner.

As many changes could be made in the above construction and many apparently widely different embodiments of our invention could be made without departing from the scope thereof, we intend that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We desire it also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. In a typewriting machine, the combination with the carriage of a rack carried thereby, a feed-pinion meshing with said rack, a shaft detachably connected with said pinion, and means for automatically effecting a disconnection between said pinion and said shaft while the carriage is being returned to initial position.

2. In a typewriting machine, the combination with the carriage and its rack of a feed-pinion meshing with said rack, a shaft carrying said pinion, pawl and ratchet mechanism for effecting a connection between said pinion and said shaft, and means for automatically rendering said pawl and ratchet mechanism inoperative while the carriage is being returned to its line-commencing position.

3. In a typewriting machine, the combination with the carriage and its rack of a feed-pinion meshing with said rack, a shaft carrying said pinion, a pawl and a ratchet wheel which constitute a connecting means between said feed-pinion and said shaft, and means for effecting a disconnection between said pawl and said ratchet wheel during the return of the carriage towards initial position.

4. In a typewriting machine, the combination with the carriage and its rack of a feed-pinion meshing with said rack, a shaft for said pinion, a pawl and a ratchet wheel which normally co-act to effect a connection between said shaft and said pinion, and means for automatically effecting a disconnection between said pawl and said ratchet wheel during the return of the carriage towards initial position.

5. In a typewriting machine, the combination with the carriage and its feed rack of a feed-pinion meshing with said feed rack, a shaft upon which said pinion is mounted, a pawl and ratchet mechanism which connects



said pinion with said shaft, and means for carrying the operative elements of said pawl and ratchet mechanism out of engagement with each other during the return of the carriage to initial position.

6. In a typewriting machine, the combination with the carriage and its feed rack of a feed-pinion meshing with said feed rack, a shaft upon which said pinion is mounted, a pawl and ratchet mechanism which connects said pinion with said shaft, and means which becomes operative automatically during the return of the carriage towards initial position for preventing a clicking of said pawl and ratchet mechanism.

7. In a typewriting machine, the combination with the carriage and its feed rack of a pinion meshing with said feed rack, a shaft upon which said pinion is mounted, a ratchet wheel rigidly mounted upon said shaft, a pawl carried by said pinion which engages said ratchet wheel and thereby compels a rotation of said shaft during the letter-feeding movement of the carriage, and means for disengaging said pawl from said ratchet wheel while the carriage is being returned to initial position.

8. In a typewriting machine, the combination with the carriage and its feed rack of a pinion meshing with said feed rack, a shaft upon which said pinion is mounted, a ratchet wheel rigidly carried upon said shaft, a pawl loosely carried by said pinion which engages said ratchet wheel and compels by such engagement a rotative movement of said shaft during the letter-feeding movement of the carriage, and means mounted upon said shaft adapted to carry said pawl from engagement with its ratchet wheel during the return of the carriage to initial position.

9. In a typewriting machine, the combination with the carriage and its feed rack of a feed-pinion meshing with said feed rack, a shaft upon which said pinion is mounted, a ratchet wheel rigidly carried by said shaft, a pawl loosely carried by said pinion which normally engages said ratchet wheel and compels by such engagement a rotation thereof during the letter-feeding movement of the carriage, and means adapted to cause said pawl to run clear of said ratchet wheel during the return movement of the carriage toward initial position.

10. In a typewriting machine, the combination with the carriage and its feed rack of a pinion meshing with said feed rack, a shaft upon which said pinion is carried, a ratchet wheel rigidly mounted upon said shaft, a pawl loosely carried by said pinion which normally engages said ratchet wheel and by such engagement compels a rotation of said shaft during the letter-feeding movement of the carriage, and means positively engaging said pawl which causes a disengagement thereof from said ratchet wheel during the

return of the carriage to its line-commencing position.

11. In a typewriting machine, the combination with the carriage and its feed rack of a feed-pinion meshing with said rack, a shaft upon which said pinion is mounted, a ratchet wheel rigidly mounted upon said shaft, a pawl loosely carried by said pinion which normally engages said ratchet wheel and thereby compels a rotation of said shaft during the letter-feeding movement of the carriage, a friction member upon said shaft and means positively engaging said pawl and having a frictional engagement with a friction member rigidly carried upon said shaft adapted for disengaging said pawl from said ratchet wheel while the carriage is moving backward to a position to begin a new line.

12. In a typewriting machine, the combination with the carriage and its feed rack of a pinion meshing with said feed-rack, a shaft upon which said pinion is mounted, a ratchet wheel rigidly mounted upon said shaft, a pawl loosely carried by said pinion which normally engages said ratchet wheel and thereby compels a rotation of said shaft during the letter-feeding movement of the carriage, and means positively engaging said pawl and frictionally engaging said ratchet wheel adapted for disengaging said last-named parts while the carriage is being moved to its line-commencing position.

13. In a typewriting machine, the combination with the carriage and its feed rack of a pinion meshing with said feed rack, a shaft for said pinion, pawl and ratchet mechanism adapted to connect said pawl with said shaft, and compel their rotation in unison when the carriage is being fed for letter-spacing, and a friction drag device for disconnecting the operative parts of said pawl and ratchet mechanism while the carriage is being returned to begin a new line.

14. In a typewriting machine, the combination with the carriage and its feed rack of a pinion meshing with said feed rack, a shaft for said pinion, pawl and ratchet mechanism adapted to connect said pinion with said shaft and compel their rotation in unison while the carriage is being fed for letter-spacing, and a friction drag device interposed between said pawl and its ratchet which operates to cause one of said parts to run clear of the other while the carriage is being returned to its line-commencing position.

15. In a typewriting machine, the combination with the carriage and its feed rack of a pinion meshing with said feed rack, a shaft for said pinion, pawl and ratchet mechanism adapted to connect said pinion with said shaft and compel their rotation in unison while the carriage is being fed for letter-spacing, and a friction drag device which op-



erates to carry said pawl away from the ratchet while the carriage is being returned to its line-commencing position.

16. In a typewriting machine, the combination with the carriage and its feed rack of a feed-pinion meshing with said rack, a shaft carrying said pinion, a ratchet wheel fixed upon said shaft, a pawl pivotally connected with said pinion adapted to engage with said ratchet wheel and compel a rotation of said shaft during the letter-feeding movement of the carriage, and a device upon said shaft which becomes operative through the reversing of the rotation of said pinion due to the returning of the carriage to initial position which swings said pawl from engagement with said ratchet wheel during such return movement of the carriage.

17. In a typewriting machine, the combination with the carriage and its feed rack of a feed-pinion meshing with said feed rack, a shaft carrying said pinion, a ratchet wheel fixed upon said shaft, a pawl pivotally connected with said pinion adapted normally to engage with said ratchet wheel and compel a rotation of said shaft during the letter-feeding movement of the carriage, and a device upon said shaft having positive engagement with said pawl which becomes automatically effective during the reversing of the rotation of said pinion due to the returning of the carriage to initial position which swings said pawl from engagement with said ratchet wheel during such return movement of the carriage.

18. In a typewriting machine, the combination with the carriage and its feed rack of a feed-pinion meshing with said feed rack, a shaft carrying said pinion, a ratchet wheel fixed upon said shaft, a pawl pivotally connected with said pinion adapted normally to engage said ratchet wheel and compel a rotation of said shaft during the letter-feeding movement of the carriage, and a device having a frictional engagement with said ratchet wheel and a positive engagement with said pawl which becomes operative through the reversing of the rotation of said pinion due to returning the carriage to initial position which automatically swings said pawl from engagement with said ratchet wheel during such return movement of the carriage.

19. In a typewriting machine, the combination with the carriage and its feed rack, of a feed-pinion meshing with said feed rack, a shaft loosely carrying said pinion, an escapement wheel rigidly mounted upon said shaft, escapement mechanism co-acting with said escapement wheel, pawl and ratchet mechanism for normally connecting said shaft with said feed-pinion and compelling the rotative movement of said shaft when said pinion is driven to rotation by the movement of the carriage and movement thereof afforded by the escapement mechanism,

and means for automatically rendering said pawl and ratchet mechanism inoperative and compelling the pawl to ride clear of its ratchet when said pinion is driven to rotation in an opposite direction by the returning of the carriage to initial position.

20. In a typewriting machine, the combination of a carriage, a feed rack mounted upon said carriage, a pinion meshing with said feed rack, a shaft loosely carrying said pinion, an escapement wheel rigidly mounted upon said shaft, escapement devices adapted to co-act with said escapement wheel, pawl and ratchet mechanism for normally connecting said shaft with said feed-pinion and compelling a rotative movement of said shaft when said pinion is driven to rotation by the feeding movement of the carriage when such movement is afforded by said escapement devices, and means which becomes effective through frictional engagement with said ratchet wheel and positive engagement with said pawl adapted for carrying said pawl out of engagement with its ratchet wheel when said pinion is driven to rotation in an opposite direction by the returning of the carriage to initial position.

21. In a typewriting machine, the combination of a power-driven carriage, escapement mechanism adapted for feeding the carriage and normally restraining the same against movement through the instrumentality of a feed rack carried by the carriage, a feed-pinion meshing with said rack, a shaft upon which said pinion is loosely mounted, pawl and ratchet mechanism for connecting together said pinion and said shaft, an escapement wheel which co-acts with said escapement mechanism, and means for disengaging the pawl of said pawl and ratchet mechanism from its ratchet and thereby allowing said pinion to run free under the compulsion of the feed rack while the carriage is being returned to initial position.

22. In a typewriting machine, the combination of a power-driven carriage having a feed rack, escapement mechanism adapted for feeding the carriage through the instrumentality of a shaft, an escapement wheel upon said shaft with which said escapement mechanism co-acts, a pinion upon said shaft meshing with the feed rack of the carriage, one of said last-mentioned elements being fixed upon said shaft, pawl and ratchet mechanism for connecting the other of said elements to said shaft whereby when the escapement mechanism is operated said escapement wheel, shaft and pinion are rotated in unison by the feeding movement of the carriage, the pawl and ratchet connection of one of said elements with said shaft enabling the escapement wheel to remain stationary while the carriage is being returned towards initial position, and means



for throwing the operative parts of said pawl and ratchet mechanism out of contact with each other while the carriage is partaking of said return movement whereby the clicking of said parts is prevented.

23. In a typewriting machine, the combination of a power-driven carriage having a feed rack, escapement devices adapted for feeding the carriage through the instrumentality of a shaft, an escapement wheel upon said shaft with which the escapement devices co-act, a pinion upon said shaft meshing with the feed rack of the carriage, one of said last-mentioned elements being fixed to said shaft, pawl and ratchet mechanism for detachably connecting the other of said elements to said shaft whereby when the escapement devices are operated said escapement wheel, shaft and pinion are rotated in unison under compulsion of the feeding movement of the carriage, the pawl and ratchet connection of one of said elements with said shaft enabling the escapement wheel to remain stationary while the carriage is being returned towards initial position, and means for automatically throwing the operative parts of said pawl and ratchet mechanism out of engagement with each other while the carriage is partaking of such return movement, thereby preventing a clicking of the pawl and ratchet mechanism.

24. In a typewriting machine, the combination of a power-driven carriage carrying a feed rack, escapement mechanism adapted for feeding the carriage through the instrumentality of a shaft, an escapement wheel upon said shaft with which the escapement mechanism co-acts, a pinion upon said shaft meshing with the feed rack of the carriage, one of said last-mentioned elements being fixed to said shaft, pawl and ratchet mechanism for connecting the other of said elements to said shaft whereby when the escapement mechanism is operated said escapement wheel, shaft and pinion are rotated in unison during the feeding movement of the carriage, the pawl and ratchet connection of one of said elements with said shaft enabling the escapement wheel to remain stationary while the carriage is returning towards its line-commencing position, and means which becomes operative the instant the carriage is started upon its return movement adapted to carry the pawl of said pawl and ratchet mechanism, and maintain said parts in a disengaged condition while such return movement is taking place, whereby a clicking of said parts is prevented.

25. In a typewriting machine, the combination of a power-driven carriage having a feed rack, escapement devices adapted for feeding the carriage through the instrumentality of a shaft, an escapement wheel upon said shaft with which the escapement devices co-act, a pinion upon said shaft which meshes with the feed rack of the car-

riage, one of said last-mentioned elements being fixed to said shaft, pawl and ratchet mechanism for connecting the other of said elements to said shaft whereby when the escapement mechanism is operated, said escapement wheel, shaft and pinion will be rotated in unison by means of the carriage, and means which becomes operative through frictional contact with certain of the above parts for throwing the pawl of said pawl and ratchet mechanism from engagement with its ratchet at the instant of returning the carriage towards its line-commencing position, and for maintaining said parts in such disengaged condition until the carriage has been fully returned; whereby a clicking of said parts is prevented.

26. In a typewriting machine, the combination of a power-driven carriage having a feed rack, escapement devices adapted for feeding the carriage through the instrumentality of a shaft, an escapement wheel upon said shaft with which said escapement devices co-act, a pinion upon said shaft meshing with the feed rack of the carriage, pawl and ratchet mechanism for connecting said pinion with said shaft, and means for disengaging the pawl of said pawl and ratchet mechanism from its ratchet while the carriage is being returned to initial position.

27. In a typewriting machine, the combination of a power-driven carriage having a feed rack, escapement devices adapted for feeding the carriage through the instrumentality of a shaft, an escapement wheel upon said shaft with which the escapement devices co-act, a pinion mounted upon said shaft which meshes with the feed rack of the carriage, a ratchet wheel carried by said shaft, a pawl carried by said pinion, said pawl and said ratchet wheel being normally engaged during the feeding movement of the carriage afforded by the escapement devices, and means interposed between said pinion and said ratchet wheel adapted to throw said pawl from engagement with said ratchet wheel while the carriage is being returned toward its line-commencing position, said means being also adapted to re-engage said pawl with said ratchet wheel when said line-commencing position is reached.

28. In a typewriting machine, the combination of a power-driven carriage having a feed rack, escapement devices adapted for feeding the carriage through the instrumentality of a shaft, an escapement wheel rigidly mounted upon said shaft with which the escapement devices co-act, a pinion upon said shaft, a ratchet wheel carried by said shaft, a pawl carried by said pinion adapted normally to engage with said ratchet wheel, and means interposed between said pinion and said ratchet wheel adapted by frictional engagement with one or both of said parts to automatically disengage said pawl from said



ratchet wheel during the return movement of the carriage towards initial position and to automatically re-engage said pawl with said ratchet wheel at the conclusion of such return movement.

29. In a typewriting machine, the combination with the carriage and the escapement mechanism, of a pinion meshing with the feed rack of the carriage, an escapement wheel which co-acts with said escapement mechanism, a shaft for said escapement wheel and said pinion, pawl and ratchet mechanism for compelling said shaft and the escapement wheel and pinion to rotate in unison when movement of the escapement wheel is afforded by the escapement mechanism but permitting the pinion to rotate independently of the escapement wheel while the carriage is being returned to initial position, and means for disconnecting the operative parts of the pawl and ratchet mechanism so that the pawl will run clear of the ratchet while such return movement of the carriage is taking place, said means being also adapted to re-engage said pawl with said ratchet at the conclusion of said return movement, or at any desired point in the return movement of said carriage.

30. In a typewriting machine, the combination of a carriage and its feed rack, a feed pinion meshing with said feed rack, a shaft detachably connected with said pinion, and means for automatically effecting a disconnection between said pinion and said shaft while the carriage is being returned to initial position and for automatically effecting a reconnection of said parts at any point in the return movement of said carriage.

31. In a typewriting machine, the combination with the carriage, of a rack carried thereby, a feed pinion meshing with said rack, a shaft carrying said feed pinion, pawl and ratchet mechanism for effecting a connection between said pinion and said shaft, and means for rendering said pawl and ratchet mechanism inoperative while the carriage is being returned to initial position and for again rendering the same operative when such initial position has been reached.

32. In a typewriting machine, the combination with the carriage and its rack, of a feed-pinion meshing with said rack, a shaft carrying said pinion, pawl and ratchet mechanism for effecting a connection between said pinion and said shaft, means for automatically rendering said pawl and ratchet mechanism inoperative while the carriage is being returned to its line-commencing position, and means for again rendering the same operative when the carriage has reached said position.

33. In a typewriting machine, the combination with the carriage and its rack, of a feed pinion meshing with said rack, a shaft carrying said pinion, a pawl and ratchet

wheel which constitute a connecting means between said feed-pinion and said shaft, and means for effecting a disconnection between said pawl and said ratchet wheel during the return of the carriage towards initial position, said means being also adapted to reconnect said pawl and said ratchet wheel at any point in the return movement of the carriage, or when said carriage has been returned to initial position.

34. In a typewriting machine, the combination with the carriage and its rack, of a feed-pinion meshing with said rack, a shaft for said pinion, a pawl and a ratchet wheel which normally co-act to effect a connection between said shaft and said pinion, and means for automatically effecting a disconnection between said pawl and said ratchet wheel during the return of the carriage toward initial position for automatically effecting a reconnection between said parts when the carriage has reached said initial position.

35. In a typewriting machine, the combination with the carriage and its feed rack, of a pinion meshing with said rack, a shaft upon which said pinion is mounted, a ratchet wheel rigidly mounted upon said shaft, a pawl carried by said pinion which engages said ratchet wheel and thereby compels a rotation of said shaft during the letter-feeding movement of the carriage, and means for automatically disengaging said pawl from said ratchet wheel while the carriage is being returned towards initial position, said means being also adapted to re-engage said pawl with said ratchet wheel whenever the pressure exerted to return the carriage to initial position is released from the carriage, whether at initial position or at any other point in its return movement.

36. In a typewriting machine, the combination with the carriage and its feed rack, of a pinion meshing with said feed rack, a shaft upon which said pinion is mounted, a ratchet wheel rigidly mounted upon said shaft, a pawl loosely carried by said pinion which normally engages said ratchet wheel and thereby compels a rotation of said shaft during the letter-feeding movement of the carriage, and means positively engaging said pawl and frictionally engaging said ratchet wheel adapted for disengaging said last-named parts while the carriage is being moved to its line-commencing position, said means also being adapted to re-engage said parts whenever the pressure which is being exerted for returning the carriage to its line-commencing position is released therefrom, whether at such initial position or at any other point in its return movement.

37. In a typewriting machine, the combination with the carriage and its feed rack, of a pinion meshing with said feed rack, a shaft for said pinion, pawl and ratchet mechanism



adapted to connect said pinion with said shaft and compel their rotation in unison while the carriage is being fed for letter-spacing, and a friction drag device which operates to carry said pawl away from said ratchet wheel while the carriage is being returned to its line-commencing position, and which carries said pawl towards said ratchet wheel and engage the same therewith when such line commencing position has been reached.

38. In a typewriting machine, the combination with the carriage and its feed rack, of a feed pinion meshing with said rack, a shaft carrying said pinion, a ratchet wheel fixed upon said shaft, a pawl pivotally connected with said pinion adapted to engage with said ratchet wheel and compel a rotation of said shaft during the letter-feeding movement of the carriage, and a device which becomes operative through the reversing of the rotation of said pinion due to the returning of the carriage towards initial position which automatically swings said pawl from engagement with said ratchet wheel during such return movement of the carriage, and which automatically swings said pawl into engagement with said ratchet wheel at whatever point the carriage is arrested in such return movement.

39. In a typewriting machine, the combination with the carriage and its feed rack, of a feed pinion meshing with said feed rack, a shaft carrying said pinion, a ratchet wheel fixed upon said shaft, a pawl pivotally connected with said pinion adapted normally to engage said ratchet wheel and compel a rotation of said shaft during the letter-feeding movement of the carriage, and a device having a frictional engagement with said ratchet wheel and a positive engagement with said pawl which becomes operative through the reversing of the rotation of said pinion due to the returning of the carriage to initial position which automatically swings said pawl from engagement with said ratchet wheel during such return movement of the carriage, and which automatically swings said pawl into engagement with said ratchet wheel at whatever point the carriage is stopped in its return movement.

40. In a typewriting machine, the combination with the carriage and its feed rack, of a pinion meshing with said feed rack, a shaft for said pinion, an escapement wheel mounted upon said shaft, a ratchet wheel carried by said shaft, a pawl carried by said pinion and normally engaged with said ratchet wheel, and a member interposed between said pinion and said ratchet wheel and having a connection with said pawl adapted automatically to swing the same from engagement with said ratchet wheel when the carriage is moved towards its line-commencing position.

41. In a typewriting machine, the combination of a carriage and its feed rack, a feed pinion meshing with said feed rack, a shaft upon which said pinion is loosely mounted, an escapement wheel upon said shaft, a ratchet wheel carried by said shaft, a pawl carried by said pinion which normally engages said ratchet wheel, escapement devices adapted to afford a feed of the carriage through the above-enumerated mechanism, and a friction member interposed between said pinion and said ratchet wheel which has a connection with said pawl adapted when the carriage is started upon its return movement to automatically swing said pawl from engagement with said ratchet wheel and maintain the same out of engagement therewith while the carriage is being returned, but to reengage said pawl with said ratchet wheel at whatever point the carriage is arrested in such return movement.

42. In a typewriting machine, the combination of a carriage and its feed rack, a feed pinion meshing with said rack, a shaft upon which said feed pinion is loosely mounted, a ratchet wheel carried by said shaft, a pawl carried by said feed pinion, a friction member interposed between said pinion and said ratchet wheel, means for yieldably holding said pinion in engagement with said member, an escapement wheel fixed upon said shaft, and escapement devices co-acting with said escapement wheel to feed the carriage, said friction member when the carriage is being fed being adapted to maintain said pawl in engagement with said ratchet wheel, and to swing the same out of engagement therewith when the carriage is being returned towards its line-commencing position and to reengage said pawl with said ratchet wheel at whatever point said carriage is allowed to rest during such return movement.

43. In a typewriting machine, the combination with a power-driven carriage and its feed rack, of a feed pinion meshing with said rack, a shaft upon which said feed pinion is loosely mounted, a ratchet wheel fixedly mounted upon said shaft, a pawl carried by a flanged portion of said pinion, a friction member interposed between the flanged portion of said pinion and said ratchet wheel, a spring for urging the flanged portion of said pinion into engagement with said friction member and which holds said friction member in contact with said ratchet wheel, an escapement wheel fixedly mounted upon said shaft, escapement devices adapted to co-act with said escapement wheel for affording feed of the carriage, said friction member being adapted to engage with a portion of said pawl whereby said pawl is maintained in engagement with said ratchet wheel during the movement of the carriage in a letter-spacing direction, and being also



adapted to swing said pawl from engagement with said ratchet wheel when the same is running in an opposite direction during the returning movement of the carriage towards initial position.

44. In a typewriting machine, the combination of a carriage power-driven in the direction of its feed, an escapement wheel adapted to be rotated in either direction to effect a step-by-step movement of the carriage in either direction, a rocker member, escapement devices including a holding dog and a feed dog mounted upon said rocker member, a wiper cam cooperating with said feed dog to raise the same when the escapement wheel is permitted to rotate to feed the carriage in one direction and to swing the same into position to engage the oncoming tooth of the escapement wheel, a movable stop for arresting the movement of said feed dog in said last-mentioned position, said last-mentioned stop being adapted to swing with said feed dog whereby said feed dog will ride over the teeth of the escapement wheel when the same is rotated in a reverse direction to back-step the carriage, and means cooperating with said escapement wheel for rotating the same in such reverse direction.

45. In a typewriting machine, the combination of a carriage power-driven in the direction of its feed, an escapement wheel adapted to be rotated in either direction to

effect a step-by-step movement of the carriage in either direction, escapement devices comprising a holding dog and a feed dog which cooperate with said escapement wheel to afford a feed of the carriage in one direction, a rocker member carrying said escapement devices, a wiper cam carried by said rocker member and cooperating with said feed dog to arrest the movement of said dog when the same swings in one direction and to swing the same into position to engage the oncoming tooth of the escapement wheel, a cushioned stop for arresting the movement of said dog in said last-mentioned position, said stop being adapted to swing with said feed dog whereby said dog will ride over the teeth of said escapement wheel when the same is rotated in a reverse direction to back-step the carriage, a pawl cooperating with the escapement wheel to rotate the same in a reverse direction, and means for operating said pawl from the key-board.

In testimony whereof we affix our signatures, in the presence of two witnesses:

WELLINGTON P. KIDDER.

CHARLES W. SPONSEL.

Witnesses as to W. P. K.:

JOHN BALLANTYNE,

ARTHUR F. HALL.

Witnesses as to said Sponsel:

HARRY R. WILLIAMS,

A. J. WELLES.