

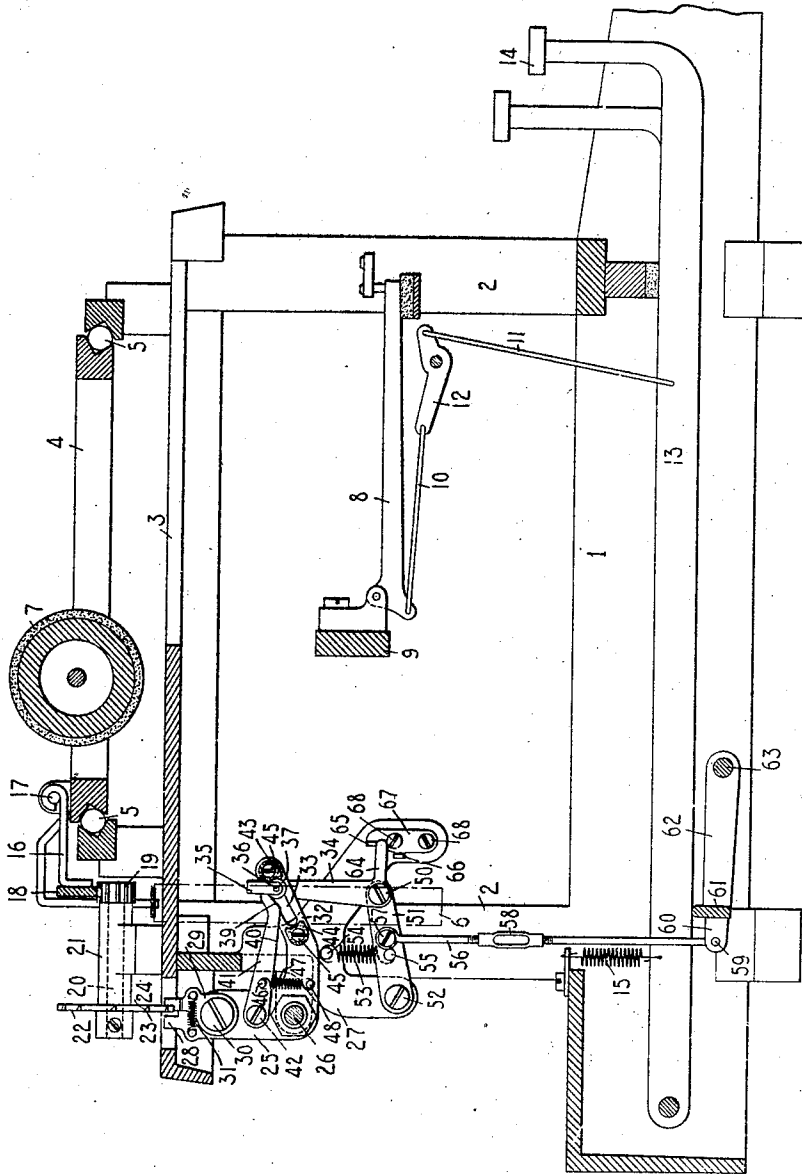
G. J. BARRETT.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 11, 1911.

1,011,719.

Patented Dec. 12, 1911.

3 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:

E. M. Wells

Charles Smith

INVENTOR:

G. J. Barrett

By J. A. F. F. F.

HIS ATTORNEY

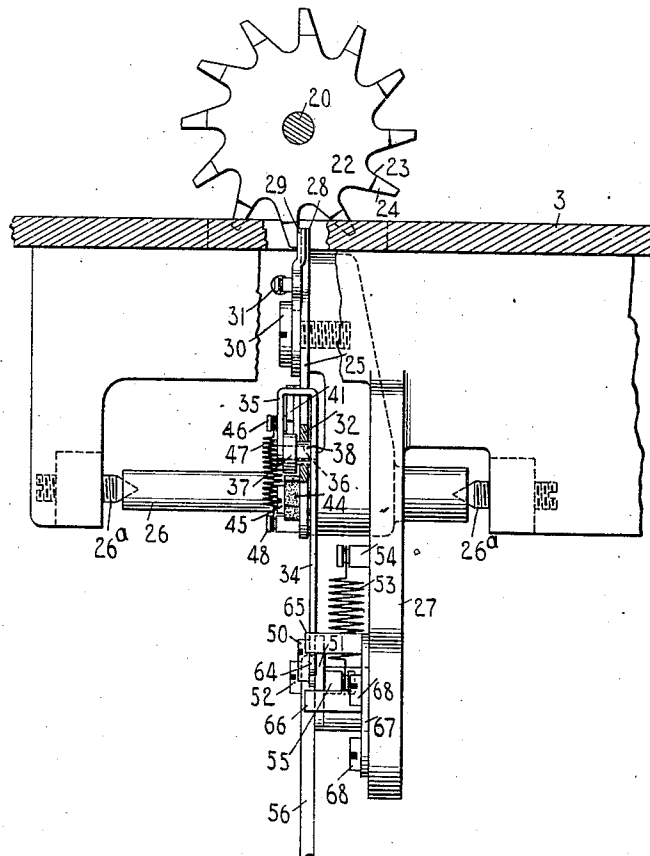
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3 SHEETS-SHEET 2.

FIG. 2.



WITNESSES:

E. M. Wells
Charles E. Hunt

INVENTOR:

Glenn J. Barrett
By Jacob F. Felt
HIS ATTORNEY

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3 SHEETS—SHEET 3.

FIG. 5.

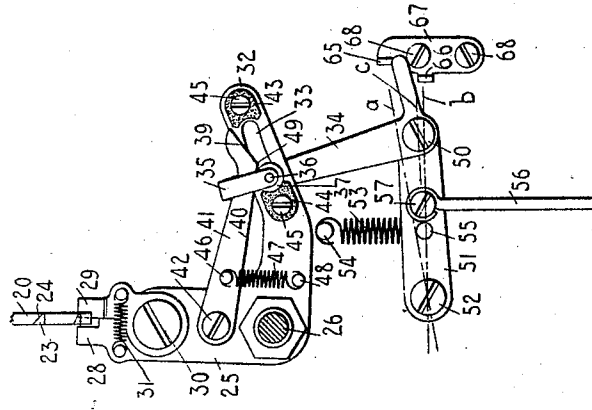


FIG. 4.

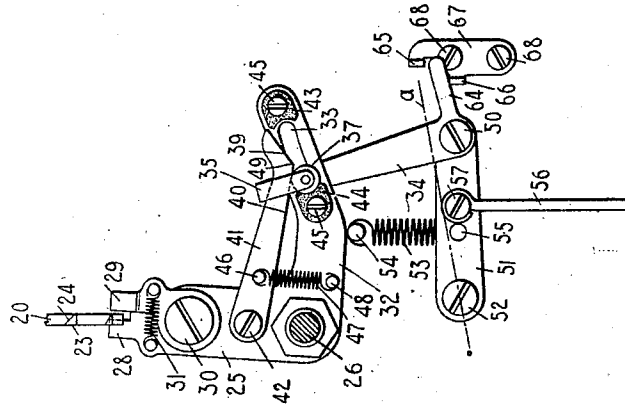
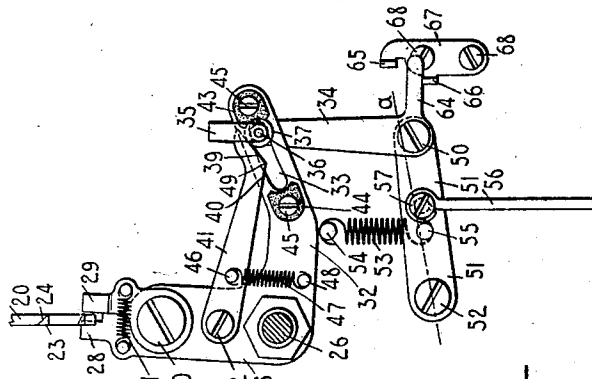


FIG. 3.



WITNESSES:

E. M. Wells.
Charles Schmidt

INVENTOR:

Glen J. Barrett
By *James F. Felt*
HIS ATTORNEY

UNITED STATES PATENT OFFICE.

GLENN J. BARRETT, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR TO UNION TYPEWRITER COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,011,719.

Specification of Letters Patent.

Patented Dec. 12, 1911.

Application filed March 11, 1911. Serial No. 613,778.

To all whom it may concern:

Be it known that I, GLENN J. BARRETT, citizen of the United States, and resident of Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and more particularly to carriage escapement mechanism.

Ordinarily in that class of escapements in which the "let-off" of the carriage is effected at the upstroke of the key, and which escapements are known as "ordinary" escapements as distinguished from "reverse" escapements, the extent that the dogs pass through the escapement rack or wheel is proportional to the extent the key is depressed, and there is often an undue "lost" travel of the dogs through the wheel and it is necessary to take up this "lost" travel of the dogs on the return stroke of the key before the carriage can be "let off", which results in an irregular acting and comparatively slow escapement.

The main object of my invention, generally stated, is to overcome the disadvantages embodied in escapements such as those referred to above and to provide a rapid, reliable, positively acting and efficient escapement which is substantially uniform in its action under different conditions of key stroke and in which the key controlled escapement member receives a complete movement in one direction at the first part of the down stroke of the key and receives a complete return movement at the first part of the return stroke of the key so that a "let-off" of the carriage is effected almost instantly upon the release of a depressed key even though there be a variation in the extent of "dip" of the keys.

To the above and other ends which will hereinafter appear, my invention consists in the features of construction, arrangements of parts and combinations of devices set forth in the following specification and particularly pointed out in the appended claims.

In the accompanying drawings wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a vertical, central, front to rear sectional view of one form of typewriting machine

embodying my invention; only a sufficient number of parts of a typewriting machine being shown to illustrate my invention in its embodiment therein. Fig. 2 is a fragmentary, detail rear elevation showing parts of the escapement mechanism; portions of the mechanism being broken away and parts being shown in section. Figs. 3, 4 and 5 are detail side elevations showing portions of the escapement mechanism; these last mentioned figures illustrating the parts disposed as they appear at different portions of a key stroke.

I have shown my invention embodied in the present instance in a machine resembling the No. 10 Remington machine, although some of the parts are only conventionally represented. It should be understood, however, that so far as my present invention is concerned, it is immaterial in what style of typewriting machine the invention is embodied or what character of type actions are employed. It is also immaterial for the purpose of the present invention what character of feed dogs and rack are used, although the invention is directed more particularly to "ordinary" escapements in which the "let-off" of the carriage is effected at the upstroke of the key.

The frame of the machine comprises a base 1, corner posts 2 and a top plate 3. A carriage 4 is mounted on anti-friction balls or rollers 5 to travel from side to side of the machine over the top plate under power transmitted to the carriage from the usual spring drum 6, which is connected to the carriage in the ordinary manner. The carriage carries a cylindrical platen 7 against the front face of which upwardly and rearwardly striking type bars 8 are adapted to strike, the type bars being segmentally arranged on a type bar segment 9. Actuating links 10 and 11 and an intermediate sub-lever 12 are interposed between each key lever 13 and the associated type bar. The key levers are provided with finger keys 14, and are returned to normal position by contractile springs 15.

Rearwardly extending arms 16 are pivoted at 17 to the carriage and support a feed rack 18 which meshes with a feed pinion 19 fixed to the forward end of the shaft 20 adapted to turn in a bearing 21 fixed to the top plate of the machine. Secured to the rear end of the shaft 20 is an escape-

ment wheel or rack 22 provided with teeth 23 beveled at 24 on the rear faces thereof for purposes which will hereinafter more clearly appear. A dog rocker or carrier 25 has its shaft 26 mounted on pivot screws 26^a received in openings in one set of arms of a bracket plate 27 secured to the frame of the machine. The upright arm of the dog rocker is formed with a fixed holding dog 28 provided with a flat working face. A stepping dog 29 is pivoted on a shouldered pivot screw 30 to the upright arm of the dog rocker, the axis of the pivot 30 being parallel with the pivotal axis 26 of the dog rocker. The dog 29 is thus maintained fixed with reference to the travel of the escapement wheel but is adapted to turn on its pivot 30 at right angles to the plane of the escapement wheel. The dog 29 is normally maintained in the position shown in Fig. 1 by a contractile spring 31 connected at one end to the dog rocker and at its opposite end to the pivoted dog 29, and the motion of said dog 29 under the impulse of said spring is limited by a shoulder of the dog rocker. From an inspection of Fig. 2 it will be understood that there is a slight "drop" between the pivoted dog 29 and the fixed dog 28, the working faces of the two dogs being maintained in parallel planes. The dog rocker 25 is provided with a forwardly extending substantially horizontally disposed arm 32 slotted at 33 for purposes which will hereinafter more clearly appear. An actuating member 34 is operatively connected to the arm 32 of the dog rocker to actuate said dog rocker at each operation of the key. The actuating member 34 in the present instance is in the nature of an angular floating lever, the upper end of the upright arm of which is formed as a yoke or loop 35 adapted to straddle the arm 32 of the dog rocker and to form a support for a pivot 36 on which an anti-friction roller 37—38 is mounted. The portion 38 of the anti-friction roller is received within the slot 33 in the dog rocker, whereas the portion 37 of the roller is adapted to cooperate with either one of the two faces 39 and 40 of a spring actuated latch or detent 41, pivoted at 42 to the dog rocker. Cushion stops 43 and 44 of felt, leather or like material are secured to one side of the rocker arm 32 by screws 45, one of said stops being provided near each end of the slot 33. The stops are so positioned that the portion 37 of the anti-friction roller 37—38 is brought into contact with either of said stops just before the portion 38 of the roller reaches the associated end of the slot 33 at which the stop is situated, in order to reduce or prevent noise resulting from the shifting movement of the actuating device 34 from one end to the other of said slot. The detent 41 is

provided with a laterally projecting pin 46 to which one end of a contractile spring 47 is connected; the opposite end of said spring being connected to a laterally projecting pin 48 on the dog rocker. The pull of this spring is exerted on the detent 41 to maintain either of the contact faces 39 or 40 in engagement with the roller 37—38 as the roller passes to one side or the other of the apex 49 between the two inclined contact faces on the detent. The pressure of the detent thus serves to assure a proper positioning of the roller 37—38 in either one or the other end of the slot 33 and prevents an accidental displacement of the roller from such position. It will be understood therefore that the actuating device 34 is adapted to be connected to the dog rocker at one point or another thereof and that the movement of the roller in the slot carries the actuating device farther from or nearer to the pivotal axis of the dog rocker, so as to vary the leverage of the actuating member 34 on the dog rocker.

The variation of the point of connection of the actuating member 34 on the dog rocker is automatically effected during the operation of the printing key as will hereinafter more clearly appear. Thus, the actuating device 34, which is in the nature of a floating lever, is pivoted by a shouldered screw 50 on the swinging end of an arm or lever 51, pivoted at 52 on the bracket plate 27. A contractile spring 53 is connected at one end to a pin 54 projecting from the bracket plate 27 and at its opposite end to a pin 55 projecting laterally from the lever 51. A depending two-part link 56 is pivoted at 57 to the lever 51, the two members of the link being united by a turn buckle 58. The lower end of the link 56 is pivoted at 59 to an arm 60 which projects rearwardly from a universal bar 61. The universal bar extends transversely of the machine beneath the series of key levers 13 and is supported at its ends on arms 62 connected to a rock shaft 63 mounted to turn in bearings in the base of the machine.

The angular floating lever 34 has a horizontally disposed arm 64 which extends between two stops 65 and 66 formed on or carried by a plate 67 secured by screws 68 to the bracket plate 27. This plate is made vertically adjustable by making the screw holes a little larger than the screws, or by elongating said holes in an up and down direction. The stops 65 and 66 extend in the path of the arm 64 of the actuating device 34 in the bodily or floating movement of the latter and the stops are operative to effect a turning of the floating lever on its fulcrum 50 to either one of the two positions shown in Figs. 3 and 4. This results in moving the upright arm of the floating lever nearer to or farther from the

pivotal axis of the dog rocker, thereby varying the point of connection between the floating lever and the dog rocker and varying the leverage accordingly.

5 In the operation of the machine a depression of a finger key is effective to move the associated type bar to the printing point and to depress the universal bar 61 and lever 51. The operation of my devices during the
10 down stroke of the key may be divided into two parts. During the first part of the depression of the arm or lever 51, the floating lever 34 moves bodily from the normal position shown in Fig. 1, where the arm 64 is in
15 contact with the abutment 65, to that indicated in Fig. 3 where said arm is in contact with the abutment 66. This movement turns the dog rocker from the position shown in Fig. 1, where the dog 29 is in engagement
20 with the escapement wheel, to that indicated in Fig. 3, where the fixed dog 28 is in engagement, without disturbing the position of the floating lever at its point of connection with the dog rocker in the outer end of the slot 33. The extent of key depression
25 necessary to bring about this movement of the dog rocker, is indicated in a general way by a comparison of the position of the lever 51 in Fig. 3 with the broken line *a* in said
30 figure which line indicates the normal position of said lever 51. The movement of the dog rocker just described is effective to carry the dog 29 out of contact with the escapement wheel and to bring the flat working
35 face of the fixed dog 28 into contact with the same tooth of the wheel that was engaged by the dog 29 as shown in Fig. 3. This movement is effected without affording an advance of the escapement wheel except the
40 very slight advance movement due to the "drop" of the engaged wheel tooth from the dog 29 to the fixed dog 28. The partial depression of the finger key thus far referred to is effective to bring about a complete
45 movement of the dog rocker in one direction. A further depression of the finger key is effective to move the parts from the positions shown in Fig. 3 to those indicated in Fig. 4. During this further depression of
50 the key the actuating device 34 is turned on its pivot 50 by the action of the stop 66 on the arm 64. This turning of the device 34 moves the roller 37—38 to the inner end of the slot 53 as shown in Fig. 4, without
55 materially moving the dog rocker from the position shown in Fig. 3. In the first part of its motion along the slot, the roller 37, 38 forces the detent 41 upwardly against the pull of its spring 47 until said roller passes
60 the apex 49, after which said spring and detent assist in moving said roller to the inner end of the slot or that nearest the pivot of the dog rocker, yieldingly retaining it against accidental displacement therefrom as
65 indicated in Fig. 4. It will be noted that

the pivoted dog is drawn out of the wheel and the fixed dog is drawn in early in the down stroke of the universal bar and that during the remainder of such down stroke said dogs remain substantially stationary, 70 the fixed dog never being drawn deeply into engagement. As soon as pressure upon the depressed key is released the lever 51 will move upwardly under the pull of the spring 53. The operation due to the up stroke of 75 this lever may be divided into two parts, the first part being that from the position shown in Fig. 4, and also indicated by the dotted line *b* in Fig. 5, to the position shown in Fig. 5 and indicated by the dotted line *c*. This 80 short movement from the position marked *b* to that marked *c*, is effective to produce a "let-off" of the carriage and to give to the dog rocker its entire return stroke. This is effected without disturbing the point of connection maintained between the floating actuating lever 34 and the dog rocker, the movement of the floating lever at this time being a bodily movement. At the first portion 90 of the return movement of the dog rocker, one side of the engaged tooth of the escapement wheel contacts with the inner edge of the dog 29, holding said dog against the pressure of its spring 31 and thus separating the dogs. A slight further movement of the 95 dog rocker is effective to disengage the dog 28 from the engaged tooth of the escapement wheel, allowing it to pass through the space between the two dogs 28 and 29. As soon as the engaged tooth of the escapement wheel is thus released, the pressure of the spring 31 is effective to move the pivoted dog 29 into the path of the next oncoming tooth of the escapement wheel, as shown in Fig. 5, to arrest the escapement wheel after a letter space 105 movement of the carriage has taken place. It will be understood, therefore, that the "let-off" of the carriage is effected by a return movement of the lever 51 from the dotted line position indicated at *b* in Fig. 5, 110 to that indicated by the dotted line *c* in said figure, and by a corresponding extent of return movement of the finger key, so that the carriage is released or "let off" almost instantly upon the release of the finger key. 115 A further upward movement of the finger key affords a further upward movement of the lever 51 from the position indicated by the broken line *c* in Fig. 5, back to the normal position indicated by the broken line *a* 120 in said figure. During this second part of the return movement of the lever 51, the floating lever 34 is turned on its pivot 52 from the position shown in Fig. 5 to that indicated in Fig. 1, by reason of the engagement of the arm 64 of the floating lever with the upper stop 65. The effect of this turning movement of the floating lever on its fulcrum, is to shift the point of connection 125 between the floating lever and the dog rocker, 130

back to the normal position shown in Fig. 1. It will be understood, however, that this restoration of the floating lever, or this change in the point of connection with the dog rocker, does not take place until after the let-off of the carriage has been effected, and that it is likewise true that the change in the point of connection between the floating lever and the dog rocker at the down stroke of the key does not take place until after a complete forward movement of the dog rocker has been effected. It follows therefore that the forward movement of the dog rocker effected at the down stroke of the finger key is produced under a long leverage on the dog rocker, with the floating lever maintained connected with the dog rocker in the position shown in Figs. 1 and 3, whereas the return movement of the dog rocker is effected under a short leverage of the floating lever on the dog rocker connected at the inner end of the slot as shown in Figs. 4 and 5. It likewise follows that the shift of the dog rocker at the down stroke under a long leverage is slower than the return of the dog rocker under a short leverage, thus affording a quick return and quick "let-off" of the carriage and that there is no "lost" travel of the dog in the return stroke of the key before the carriage is "let off". In this construction the entire extent of movement of the dog rocker in one direction is indicated by its movement from the position shown in Fig. 1 to that indicated in Fig. 3, whereas the entire extent of return movement is that indicated by the movement of the dog rocker from the position shown in Fig. 4 to that indicated in Fig. 5. Moreover, it will be understood that although a change in the relation of the parts by which the key actuated escapement member is controlled is automatically effected, said member is always under control of the keys in both the down stroke and up stroke of each key. Otherwise stated, there is a constantly maintained operative connection between the finger keys and the dog rocker notwithstanding the change in the relation between the intermediate connections, and the dogs in their back and forth movements through the rack are therefore always under control of the keys and a reliable and positive control of the escapement by the keys is provided and nevertheless a quick "let-off" of the carriage is effected at the first part of the return movement of a key whether the dip of the key be deep or shallow. The escapement therefore is rapid in operation, positive in its control of the carriage and efficient in use and is well adapted to operators having either a long following stroke, or a short quick stroke and it is reliable in its action under different conditions of use.

The rear beveled faces 24 on the teeth of the escapement wheel cooperate during the

backward movement of the escapement wheel with a corresponding bevel on the rear side of the feed dog 29 to force said dog to one side out of the path of the teeth of the escapement wheel when the carriage is being moved from left to right so that the escapement affords no obstruction to the movement of the carriage in said direction.

It will be understood that the two arms formed by the horizontally disposed arm of the dog rocker and the lever 51 are mounted on parallel axes and constitute practically parallel arms; that the axis of the pivot 50 of the floating sub-lever is likewise parallel with the axis of the dog rocker; that the feed dogs or the dogs and rocker constitute in effect one escapement member cooperative with the other escapement member which in the present instance is shown as an escapement wheel; that there are intermediate connecting devices between the key controlled escapement member or dog rocker and the finger keys; that said intermediate connections include automatically actuating leverage changing mechanism to vary the speed between the movement of the key controlled escapement member in a down-stroke of the key and in an upstroke of the key; that by reason of this automatic change of leverage it requires less movement of a key to effect a complete return movement of the dog rocker than is required to effect a complete movement of the dog rocker from normal position; that there are provided means for automatically shifting the point of connection between a key controlled actuating member and the dog rocker and for moving the point of such connection either nearer to or farther from the pivotal axis of the dog rocker; that the lever 34 constitutes a floating lever for actuating one of the escapement members under control of the keys; and that said floating lever is cooperative with stops by which the lever is turned on its fulcrum to vary its position with reference to the member which it controls and with reference to the pivot of the dog rocker.

I believe that I am the first to have provided automatically operating variable leverage connections between the finger keys and one of the escapement members, the variable leverage mechanism affording a different leverage on the escapement member at the up stroke of the key from what it does on the down stroke, and while I have shown one form or embodiment of my invention it will be understood that various changes may be made without departing from the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor,

said escapement mechanism comprising co-operative escapement members, and automatically operating variable leverage connections between said finger keys and one
 5 of said escapement members, the variable leverage mechanism being such as to afford a different leverage on the escapement member at the up stroke of the key from what it does on the down stroke to thereby vary the
 10 speed at which said last mentioned member is moved at the up and down strokes of a key.

2. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker, and connections from said finger keys to said dog rocker, said connections including automatically operating means for
 15 varying the point of operative connection between said connections and the dog rocker with reference to the pivot of the latter so as to afford a movement of the rocker by a relative long leverage on the
 20 down stroke of the key and a movement of the rocker by a relative short leverage on the up stroke of the key.

3. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker, constantly maintained operative actuating connections between said finger keys and dog rocker, said connections including means by which a faster movement
 30 of the dog rocker is effected in one direction than in the other.

4. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker, a key controlled actuating member co-operative with said dog rocker, and
 40 automatically operating means for moving said member nearer to the pivot of the dog rocker at the down stroke of the key and after the dog rocker has completed its movement in one direction.

5. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker, a key controlled actuating member co-operative with said dog rocker, and
 50 automatically operating means for moving said member nearer to the pivot of the dog rocker at the down stroke of the key and after the dog rocker has completed its movement in one direction and for automatically
 60 moving said member away from the pivot of the dog rocker at the up stroke of the key and after the dog rocker has completed its return movement.

6. In a typewriting machine, the combination of finger keys; a power driven car-

riage; and escapement mechanism therefor, said escapement mechanism comprising two co-operative escapement members one being movable back and forth relatively to the other under control of said keys, the
 70 said key controlled member moving in one direction at the down stroke of the key and moving in the opposite direction at the up stroke of the key, and variable leverage means by which less movement of the key is
 75 effective to afford a complete movement of the said key controlled member in one direction than is required of said key to effect a complete movement of the key controlled member in the opposite direction.

7. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising two co-operative escapement members, intermediate constantly maintained operative connections between the finger keys and said key controlled member of the escapement to control said member by the keys at the up stroke as well as the down stroke of each
 80 key, and automatically operating means for changing the relation between the parts of said connections so that less return movement of a finger key is required to return the key controlled member to normal position than is required to move the said member to the limit of its movement from normal position.

8. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising an escapement rack, a dog rocker, intermediate constantly maintained operative connections between the finger keys and said
 105 dog rocker to control said dog rocker by the keys at the up stroke as well as at the down stroke of each key, and automatically operating means for changing the relation between said connections and said dog rocker in such a manner that less return movement of a finger key is required to return the dog rocker to normal position than is required to move the rocker to the limit of its movement from normal position.

9. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog carrier, parallel actuating arms between said
 120 dog carrier and keys, a member that connects said parallel arms, and automatically operating means for shifting the point of connection between said member and one of said arms so that the member will have one point of connection with an arm during the movement of the carrier in one direction and will have another point of connection with said arm during the movement of the carrier in the opposite direction.

10. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog carrier, parallel actuating arms between said dog carrier and keys, a member that connects said parallel arms, automatically operating means for shifting the point of connection between said member and one of said arms so that the member will have one point of connection with an arm during the movement of the carrier in one direction and will have another point of connection with said arm during the movement of the carrier in the opposite direction, and an automatically operating detent to hold the member against accidental displacement from either of the two points at which it may be connected with the arm.
11. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker, a key controlled member for actuating said dog rocker, automatically actuated means for shifting said member from one point to another on the dog rocker, and a spring actuated detent for assuring the movement of the member from one point to another on the dog rocker and for holding the member against accidental displacement from either of the positions to which it may be shifted on the rocker.
12. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker having a slotted arm, a key, actuated member having a roller working in the slot of the dog rocker, automatically actuated means for shifting said member to bring the roller in one end or the other of said slot, and a spring actuated detent operating on said member to assure a movement thereof to bring the roller to one end or the other of said slot and to hold the member against accidental displacement from the position to which it has been shifted.
13. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker, a key actuated bodily movable lever coöperative with said dog rocker to actuate it, and automatically acting means for turning said lever on its pivot to vary the point of connection between said lever and the dog rocker.
14. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker, a key actuated bodily movable angular lever having one arm operatively connected with the dog rocker, and stops in the path of the other arm of said lever to turn the lever on its fulcrum and thereby change the point of connection between said lever and the dog rocker.
15. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker, a key actuated bodily movable angular lever having one arm operatively connected with the dog rocker, and stops in the path of the other arm of said lever to turn the lever on its fulcrum and thereby change the point of connection between said lever and the dog rocker, the construction and relative arrangement of the parts being such that the lever is shifted on its fulcrum in one direction at the last portion of the down stroke of the key and after the dog rocker has completed its movement in one direction and is shifted in the opposite direction on its fulcrum at the last portion of the up stroke of the key and after the dog rocker has completed its return movement.
16. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker, a key actuated bodily movable lever coöperative with said dog rocker to actuate it, and automatically acting means for turning said lever on its pivot to vary the point of connection between said lever and the dog rocker, the shifting of the point of connection between said lever and the dog rocker being toward and away from the pivot of the latter to vary the leverage on the dog rocker.
17. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker, a key actuated bodily movable lever coöperative with said dog rocker to actuate it, and automatically acting means for turning said lever on its pivot to vary the point of connection between said lever and the dog rocker, the shifting of the point of connection between said lever and the dog rocker being toward and away from the pivot of the latter to vary the leverage on the dog rocker, the construction and relative arrangement of the parts being such that the lever operates with the longest leverage on the rocker during the movement of the rocker from the normal position and operates with the shortest leverage during the movement of the rocker to normal position.
18. In a typewriting machine, the combination of finger keys, a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker, a floating lever connected there-

with, a key controlled lever connected to said floating lever, and automatically operating means for turning said floating lever on its fulcrum during its floating movement to vary the point of connection between the floating lever and the dog rocker.

19. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker, a floating lever connected therewith, a key controlled lever connected to said floating lever, and stops coöperative with the floating lever during its bodily movement to turn said floating lever on its fulcrum and thereby vary the point of connection between the floating lever and the dog rocker.

20. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor, said escapement mechanism comprising a dog rocker, a key actuated lever pivoted on an axis parallel with the axis of the dog rocker, a floating lever pivoted on said key actuated lever and connected with said dog rocker, the axis of the pivot which connects the key actuated lever and the floating lever being parallel with the axis of the dog rocker, and stops which are interposed in the path of a part of the floating lever to turn it on its pivot and thereby shift the point of connection between the floating lever and the dog rocker.

21. In a typewriting machine, the combination of a power driven carriage; finger keys; and escapement mechanism for the carriage, said escapement mechanism comprising an escapement rack, a dog carrier, intermediate actuating connections between the finger keys and the dog carrier including an actuating member, and an abutment in the path of said actuating member and

which shifts it from one point on the dog carrier to another at the depression of a finger key.

22. In a typewriting machine, the combination of a power driven carriage; finger keys; and carriage escapement mechanism comprising coöperative escapement members, a floating key actuated pivoted actuating device operatively connected with one of said escapement members, and automatically operating means for turning said pivoted actuating device on its pivot at the down stroke of a key to vary the point of connection between said actuating device and the escapement member with which it is connected.

23. In a typewriting machine, the combination of finger keys; a power driven carriage; and escapement mechanism therefor comprising a feed rack, a dog rocker, feed dogs carried thereby, a key actuated bodily movable actuating member operatively connected with said dog rocker, and an abutment with which said actuating member coöperates in its bodily movement to shift it relatively to the dog rocker, the construction and relative arrangement of the parts being such that said actuating member is shifted in one direction after the dog rocker has moved one dog out and the other dog into the rack at the down stroke of a key and is shifted in the opposite direction after one dog has moved out of and the other dog has moved into the rack at the up stroke of the key.

Signed at Grand Rapids, in the county of Kent, and State of Michigan, this sixth day of March A. D. 1911.

GLENN J. BARRETT.

Witnesses:

HELEN M. NEWTON,
LULU B. VALENTINE.