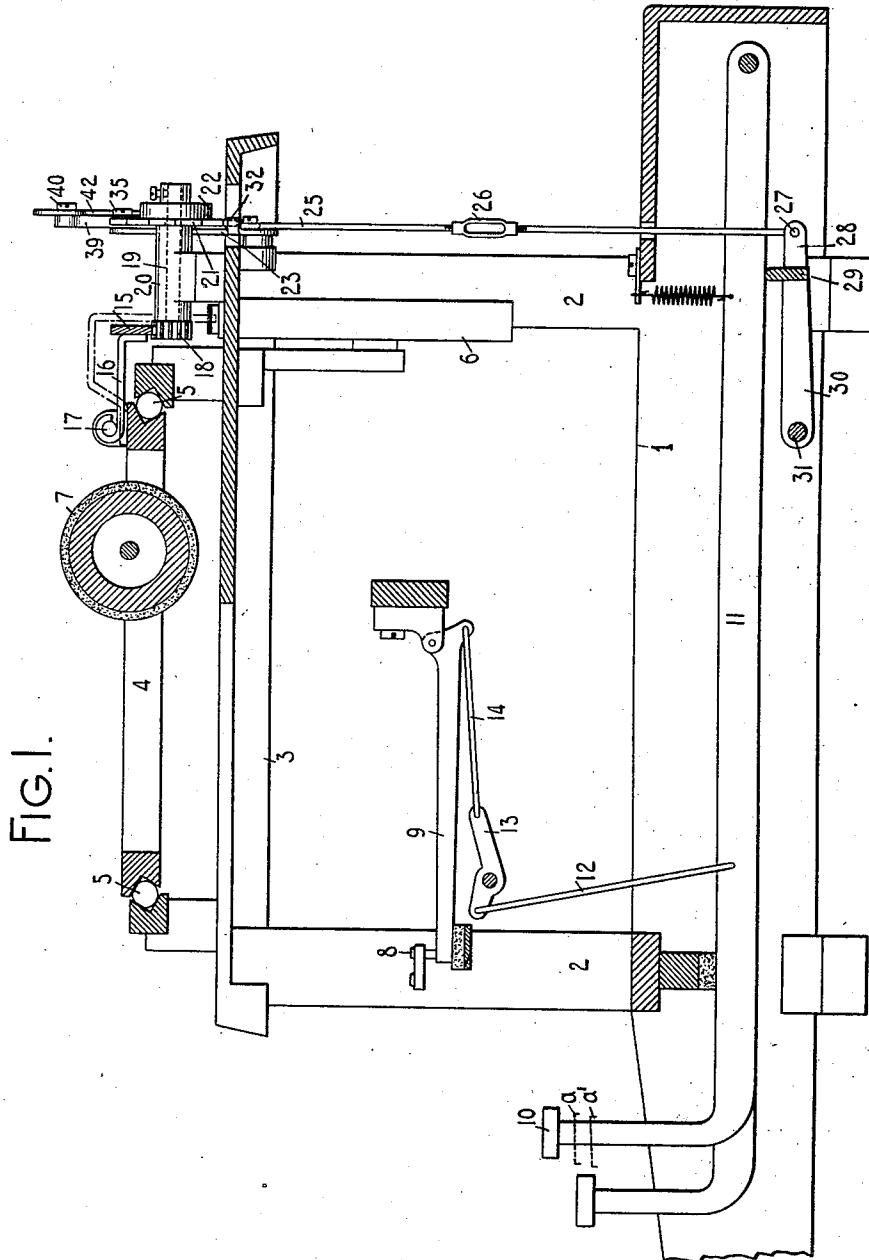


1,011,722.

2 SHEETS--SHEET 1.



E. M. Wells.
Charles Smith.

Glenn J. Barrett
By Jacob Felbel
HIS ATTORNEY

1,011,722.

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

Patented Dec. 12, 1911.

2 SHEETS—SHEET 2.

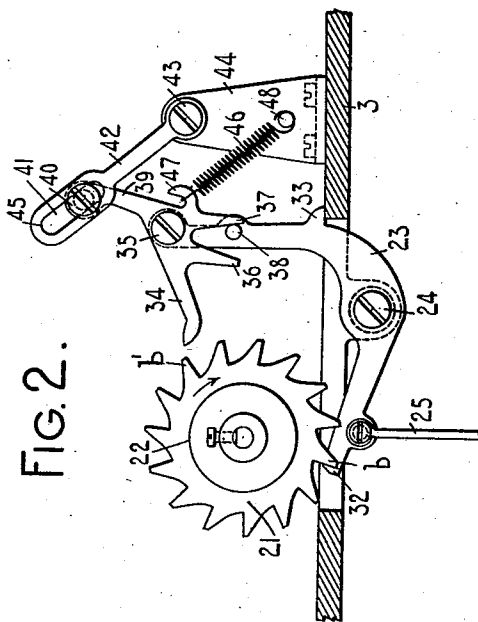


FIG. 2.

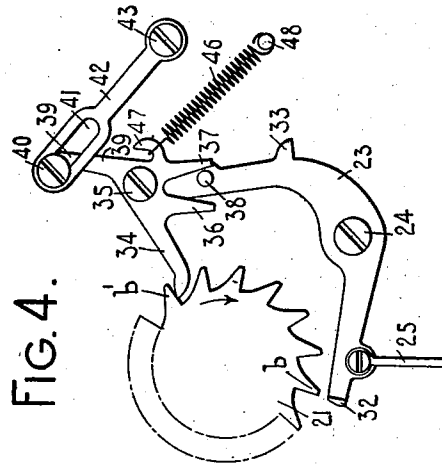


FIG. 4.

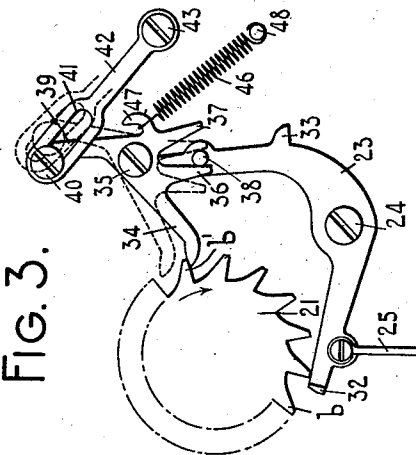


FIG. 3.

WITNESSES:

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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.

1,011,722.

Specification of Letters Patent.

Patented Dec. 12, 1911.

Application filed March 11, 1911. Serial No. 613,781.

To all whom it may concern:

Be it known that I, GLENN J. BARRETT, a 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.

A "reverse" escapement is the most speedy escapement and for this reason is highly desirable and may be used with great effectiveness by some operators but in the hands of other operators it cannot be used without producing blurred imprints. Thus, a "reverse" escapement may be effectively employed by an operator who has a short, quick stroke and who does not depress each key to the limit of its movement or does not allow the finger to follow the key down throughout the stroke. With such a touch the type bar, which has a speed so far in excess of the carriage, actually strikes the platen before the carriage has started to move and rebounds quickly and remains away from the platen while the carriage is in motion. On the other hand, with an operator who has a long, following stroke, the finger following each key until it has reached the limit of its depression, there is a liability of producing double imprints, shading or "ghosts" because at the time of and after the imprint such an operator maintains pressure on the key, holding or forcing the type against the platen when the carriage is in motion. It follows therefore that a "reverse" escapement cannot be used by the last mentioned operators without detriment to the work produced on the machine.

The main object of my invention is to overcome the above mentioned disadvantages and to provide an escapement which will respond equally well to both classes of operators and which will act automatically either as a "reverse" or "ordinary" escapement, depending on the extent of depression given the finger keys.

A further object of my invention is to provide an escapement in which the power employed to move the carriage is utilized to move the parts of the escapement mechanism back to normal position.

To the above and other ends which will

hereinafter appear, my invention consists in the features of construction, arrangement of parts and combinations of devices to be hereinafter described 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, fore and aft sectional view of one form of typewriting machine embodying my invention. Fig. 2 is a detail rear elevation of a portion of the escapement mechanism, the parts being shown in normal position. Fig. 3 is a like view of the same, parts being represented disposed as they appear after a letter space movement of the carriage has been effected under a "reverse" feed. Fig. 4 is a view corresponding to Figs. 2 and 3 except that the parts are shown disposed as they appear when a deeper key depression has been effected than is indicated in Fig. 3 and the escapement is operating under "ordinary" feed.

I have shown my invention embodied in the present instance in a No. 10 Remington machine, although some of the parts of said machine are only conventionally represented. It should be understood, however, that so far as my present invention is concerned, it is immaterial what style of typewriting machine the escapement mechanism is embodied in or what character of type action is employed.

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 over the top plate under the power of a spring drum 6. A cylindrical platen 7 is carried by the carriage and receives the impact of the types 8 against the front face thereof. Type bars 9 are actuated through any suitable connections by finger keys 10. In the present instance each finger key is connected to a key lever 11 to which an actuating link 12 is pivoted. Each link 12 is connected to a sub-lever 13 which in turn is connected through a link 14 with a type bar 9.

A feed rack 15 is mounted on arms 16 pivoted to the carriage at 17. The feed rack meshes with a feed pinion 18 fixed to the forward end of a shaft 19 mounted in a suitable bearing 20 fixed to the top plate of the machine. The shaft 19 is operatively connected at its rear end portion to an es-

capement rack or wheel 21 through the usual pawl and ratchet mechanism contained within a drum 22. The escapement wheel is thus operatively connected to be
 5 turned by the carriage during the letter space feed movement thereof or during the movement of the carriage from right to left, whereas the escapement wheel remains at rest during the movement of the carriage from left to right. A dog rocker 23
 10 is in the nature of an angular lever pivoted at 24, the axis of the pivot 24 being parallel with the axis of the escapement wheel. One arm of this lever-like dog rocker is connected to a depending link 25
 15 which comprises two members united by a turn buckle 26. The lower end of the link 25 is pivoted at 27 to a rearwardly extending arm 28 which projects from a universal bar 29. The universal bar extends transversely
 20 of the machine beneath the series of key levers 11 and is mounted on arms 30 which extend rearwardly from a rock shaft 31 pivoted at its ends in the base of the machine. The lower horizontally extending arm of
 25 the dog rocker is provided with a laterally projecting holding dog 32 fixed to or formed as a part of the dog rocker. This holding dog is adapted to move into and out of the path of the teeth of the escapement wheel
 30 in the plane of the wheel as shown in Figs. 2 and 3. The dog rocker is limited in its movement in one direction, or back to normal position, by a stop or projection 33 on the dog rocker which is adapted to contact
 35 with the top plate of the machine. A stepping dog 34 is pivoted on the upwardly extending arm of the dog rocker by a shouldered pivot screw 35 so that the stepping dog is pivoted on one side of the dog rocker
 40 to turn on its pivot in the same plane as the escapement wheel. The stepping dog has two stop arms 36 and 37 which are adapted to cooperate with a pin 38 projecting laterally from the upright arm of the
 45 dog rocker, to limit the movement of the stepping dog relatively to the dog rocker in both directions. An upwardly extending arm 39 is formed on the stepping dog and is tapped to receive a shouldered screw
 50 40 which extends through a slot 41 in a link or stop member 42 to form a lost motion or pin and slot connection between the link and stepping dog. This link is pivoted at
 55 one end on a shouldered screw 43 carried by an upwardly extending fixed bracket 44. The link 42 is free to swing downwardly with the stepping dogs as the latter moves from the position shown in Fig. 2 to that
 60 illustrated in Fig. 3 for instance.

When the dog rocker is moved by the depression of a key to either of the positions shown in Figs. 3 or 4, the screw 40 is moved to the end 45 of the slot in the link
 65 42. When said screw contacts with the end

wall of the slot, as shown in Fig. 4 for example, it holds the stepping dog against rotative movement around its pivot 35 by a pressure exerted against the stepping dog by the escapement wheel and thus resists
 70 the movement of the escapement wheel in a letter space direction indicated by the arrows in Figs. 2, 3 and 4. A contractile spring 46 is fastened at one end to a hook 47 formed on the stepping dog and is fixed
 75 at its opposite end to a pin 48 which projects from the bracket 44. The power of this spring is exerted to normally maintain the stepping dog with the stop arm 37 thereof against the stop pin 38, as shown in
 80 Fig. 2, and to normally maintain the relation shown in said figure between the stepping dog and the link or stop 42 and said spring also acts as a restoring spring for the dog rocker. It will be observed that the
 85 only spring shown for restoring the stepping dog, the dog rocker and the universal bar to normal position, is the spring 46. If desired, a separate spring may be employed for restoring the universal bar and dog
 90 rocker to normal position and in this event a very light spring 46 might be employed since the only function of this spring in such an event would be to turn the stepping dog to normal position on the dog
 95 rocker and to move the link 42 to normal position.

The escapement mechanism operates somewhat differently, depending upon the conditions under which the machine is actuated.
 100 If, for instance, the operator has a short, snappy stroke, removing the finger from the key when the key is depressed to some such position as that represented in dotted lines at *a* in Fig. 1 for instance, then this will
 105 effect a "reverse" feed of the escapement, moving the dog rocker from the position shown in Fig. 2 to that represented in Fig. 3. This movement is effective to withdraw the holding dog 32 from the engaged tooth *b*
 110 and to move the stepping dog into the path of the first oncoming tooth *b'* of the escapement wheel. The stepping dog is brought into the path of the oncoming tooth *b'* of the escapement wheel before the holding dog
 115 is released from the tooth *b*. As soon as the holding dog clears the tooth *b* the power of the carriage is effective to turn the escapement wheel and the pressure of the wheel turns the stepping dog on its pivot 35,
 120 against the pull of the spring 46, from the dotted to the full line position shown in Fig. 3, thus affording a letter space advance of the carriage. This turning movement of the stepping dog on its pivot 35 is arrested when
 125 the screw 40 travels from the dotted to the full line position in Fig. 3 and the screw reaches the outer end of the slot in the stop or link 42, or when the stop arm 36 is brought into contact with the stop 38. It
 130

will be understood that the carriage is released for this letter feed movement during the downstroke of the key and before the key has reached the limit of its depression, so as to provide a "reverse" feed.

As hereinbefore explained, the release of the carriage is effected under the conditions stated by a movement or "dip" of a finger key less than the full extent of depression of which the key is capable, as, for example, from the full line position shown in Fig. 1 to some such position as that shown in dotted lines at *a*. This partial depression of the finger key is effective, however, to throw the type bar to the printing point and to effect an imprint before the carriage has started to move. At the time the imprint is effected there is no pressure exerted upon the key which tends to maintain the type against the platen. If, on the other hand, the operator should have a long following stroke, maintaining pressure on the finger key until the key has completed its downward movement to the position represented by dotted lines at *a'* in Fig. 1, then the dog rocker will be moved continuously at a single stroke from the position shown in Fig. 2 to that represented in Fig. 4. The effect of this movement of the dog rocker is to carry the stepping dog into engagement with the tooth *b'* before the tooth *b* of the escapement wheel is released by the holding dog 32 and to force the stepping dog to a position and hold it near the base of the engaged tooth *b'* of the escapement wheel before the wheel has had an opportunity to be moved by the carriage as shown in Fig. 4. When the parts are disposed as shown in this figure, it will be seen that the screw 40 is seated in the outer end of the slot in the link 42, so that the link at this time acts as a stop to prevent a rotative movement of the stepping dog on its pivot 35, and the dog rocker being maintained under the pressure of the finger key in the position shown, holds the escapement wheel against forward or letter feed movement. When pressure is released, however, on the depressed finger key the dog rocker returns to normal position and as it is returning affords a movement of the stepping dog on its pivot 35 to allow a letter feed movement of the escapement wheel; the carriage advancing as the dog rocker returns to normal position, thus effecting an "ordinary" instead of a "reverse" feed. It will be understood, therefore, that even if the operator should maintain pressure on the finger key after it is fully depressed so as to hold the type against the platen, no double imprint or blur could be effected since under these conditions the carriage does not travel until pressure is released on the depressed key.

If it should so happen that the carriage starts to move and the escapement wheel

starts to turn before the completion of a long following stroke on the key, the pressure of the finger exerted upon the key is effective to turn the escapement wheel backwardly and to restore the carriage to the letter space position from which it started to move. It is believed that this will be clearly understood from an inspection of Fig. 4, from which it will be seen that downward pressure exerted on the link 25 is effective to force the stepping dog 34 in a direction opposite to that in which the escapement wheel moves during the letter feed movement of the carriage. For this reason there can be no double imprint effected even if the carriage starts to move before a long following stroke is completed since the carriage is moved back to its proper letter space position before the impact of the type on the platen and the complete letter space movement is effected on the upstroke of the key and after the imprint has been produced. It follows therefore that this is an "ordinary" feed, and is so regarded for the purposes of the present invention. Thus, even though the carriage may have advanced a considerable portion of a letter-space movement before it has been cammed back, it nevertheless has not been "let off" or freed from control of the escapement mechanism and has not completed its letter-feed movement to the next letter-space position. This does not take place until the up stroke of the key and the feed therefore constitutes an "ordinary" feed. While I have described with some detail this advance and camming back of the carriage, in certain circumstances, it should be understood that in practice this action seldom occurs as a long following down stroke of the key is seldom, if ever, so slow that the dog 34 will not move into full, or substantially full, engagement with a tooth of the escapement wheel, as shown in Fig. 4, before the latter has had an opportunity to advance.

From an inspection of Figs. 2 and 4 it will be understood that whenever the escapement wheel engages the stepping dog for "ordinary" feed, the power of the carriage, exerted through the escapement wheel, is utilized to force the parts back to normal position. Thus, for instance, the escapement wheel bearing upon the stepping dog as shown in Fig. 4 tends to force it to the right and to force the dog rocker and the parts connected therewith back to normal position. Otherwise expressed, at the termination of a down stroke of the key in "ordinary" feed, the stepping dog is maintained in engagement with the escapement wheel to hold it against advance movement and the pressure of the carriage is thus exerted through the escapement wheel and stepping dog to restore the dog rocker and

the parts connected therewith to normal position. The pressure of the power employed to move the carriage is thus utilized to restore parts of the escapement mechanism to normal position and thus greatly enhance the rapidity of the escapement.

It will be observed that the movement of both the stepping dog and holding dog toward and away from the escapement wheel is in the plane of, or in a plane coincident with the plane of the escapement wheel. It will also be seen that the stepping movement of the stepping dog around its pivot 35 is likewise in such a plane.

From the foregoing description it will be understood that I have provided a comparatively simple and efficient escapement mechanism in which the mechanism operates either as an "ordinary" or "reverse" escapement, depending on the extent of dip or depression of the finger keys; that the escapement mechanism is adapted to operators having either a short quick touch or a long following stroke on the keys; and that the escapement mechanism will not produce a blurring which ordinarily follows from an operator of the last mentioned class operating a "reverse" escapement.

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 a power driven carriage, printing instrumentalities, finger keys therefor, coöperative escapement members, and means for controlling said escapement members to afford an "ordinary" or "reverse" feed of the carriage depending on the extent of "dip" given the finger keys.

2. In a typewriting machine, the combination of a power driven carriage, printing instrumentalities, finger keys therefor, coöperative carriage escapement members, and means for controlling said escapement members to afford a release and letter-feed advance of the carriage to the next letter-space position at an incomplete depression of a finger key, and to prevent such release and letter-feed advance of the carriage from taking place until the up stroke of the key if a complete key depression has been effected.

3. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including an escapement rack, a stepping dog, and means by which said dog may receive a stepping movement under pressure of the escapement rack to afford a letter space advance of the carriage when a finger key is partly depressed and for

holding said dog against stepping movement when the key is fully depressed and thereby prevent a letter space advance movement of the carriage at a full depression of the key.

4. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including an escapement rack, a dog rocker, a holding dog fixed to said rocker, a loose or stepping dog carried by and movable on said dog rocker, and means by which an incomplete dip of a finger key is effective to bring about a movement of the stepping dog by the pressure of the escapement rack thereon, whereas a complete dip of a finger key is effective to hold the stepping dog and maintain the rack against advance movement.

5. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including an escapement rack, a stepping dog, and means for enabling the escapement rack to move the stepping dog at a partial depression of a finger key and for rendering the stepping dog effective to hold the escapement rack against advance movement when a finger key has been fully depressed.

6. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including a dog rocker, a stepping dog carried thereby and movable thereon, and means by which the pressure on a finger key is effective through the dog rocker and stepping dog to prevent a letter space movement of the carriage when a full depression of the finger key has been effected and for affording a letter feed advance of the carriage when only a partial depression of a finger key has been effected.

7. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including an escapement rack, a dog rocker, a stepping dog carried by and movable on said dog rocker and which receives a movement from the escapement rack to advance the carriage when a finger key is only partly depressed, and a stop with which said stepping dog is coöperative when a finger key is fully depressed to render said stepping dog effective to hold the escapement rack against advance movement.

8. In a typewriting machine, the combina-

tion of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including an escapement wheel, a stepping dog mounted for stepping movement and for bodily movement into and out of coöperation with the escapement wheel in a plane coincident with the plane of the escapement wheel, and means for controlling the stepping dog in such movements to afford a "reverse" or "ordinary" feed depending upon the extent of key depression.

9. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including an escapement wheel, a stepping dog mounted for stepping movement and for bodily movement into and out of coöperation with the escapement wheel in a plane coincident with the plane of the escapement wheel, and means for controlling the stepping dog in such movements to afford a "reverse" or "ordinary" feed depending upon the extent of key depression and for utilizing the power employed to move the carriage to restore the escapement mechanism to normal position.

10. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including means by which an "ordinary" or "reverse" feed of the carriage is effected depending on the extent of "dip" given the finger keys, and means by which the power employed to move the carriage is utilized in restoring the escapement mechanism to normal position when an ordinary feed is effected.

11. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including an escapement rack, a stepping dog, and means by which said dog may receive a stepping movement under pressure of the escapement rack to afford a letter space advance of the carriage when a finger key is partly depressed and for holding said dog against stepping movement when the key is fully depressed and thereby preventing a letter space advance movement of the carriage at a full depression of the key, the stepping dog when thus held being constantly forced away from the escapement rack by the power employed to move the carriage, thus tending to force the part which carries said dog back to normal position.

12. In a typewriting machine, the combi-

nation of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including an escapement wheel, an angular dog rocker, a holding dog fixed to one arm of said angular dog rocker, a stepping dog pivoted to the other arm of said angular dog rocker and both of said dogs moving in a plane coincident with the plane of the escapement wheel, and means which afford a stepping movement of the stepping dog under the action of the escapement wheel thereon when a key receives only a partial depression and which prevents such movement of the stepping dog when the key receives a full depression.

13. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including an escapement wheel, an angular dog rocker, a holding dog fixed to one arm of said angular dog rocker, a stepping dog pivoted to the other arm of said angular dog rocker and both of said dogs moving in a plane coincident with the plane of the escapement wheel, and a stop supported independently of the dog rocker and coöperative with the stepping dog when a key is fully depressed to prevent a stepping movement of the stepping dog under the action of the escapement wheel thereon.

14. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including an escapement wheel, an angular dog rocker, a holding dog fixed to one arm of said angular dog rocker, a stepping dog pivoted to the other arm of said angular dog rocker and both of said dogs moving in a plane coincident with the plane of the escapement wheel, and means which afford a stepping movement of the stepping dog under the action of the escapement wheel thereon when a key receives only a partial depression and which prevents such movement of the stepping dog when the key receives a full depression, the power employed to move the carriage being exerted on the stepping dog to return the dog rocker to normal position when a full depression of the key is effected.

15. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including means by which an "ordinary" or "reverse" feed of the carriage is effected depending on the extent of "dip" given the finger keys and said means

including a stepping dog, and a link pivoted to a fixed part of the structure and operatively connected with said dog to afford a stepping movement of the dog when a partial key depression is effected and to prevent a stepping movement of the dog when a full depression of a key is effected.

16. In a typewriting machine, the combination of a power driven carriage; and escapement mechanism therefor including automatically controlled means for effecting either "ordinary" or "reverse" feed of the carriage and for utilizing the power employed to move the carriage to restore parts of the escapement mechanism to normal position when the carriage is being fed "ordinary."

17. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including an escapement wheel, a stepping dog movable in its stepping movements and in its movement into and out of coöperation with the escapement wheel in a plane coincident with the plane of said escapement wheel, a link pivoted to a fixed part at one end and operatively connected at its other end by a lost motion connection to said stepping dog to render the stepping dog free to step at one part of a key depression and to hold it against stepping movement at another part of a key stroke.

18. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under con-

trol of said finger keys, said escapement mechanism including an escapement wheel, a dog rocker pivoted to turn on an axis parallel with the axis of the escapement wheel, a holding dog fixed to said dog rocker, a stepping dog pivoted on said dog rocker, the axis of the pivot of the stepping dog being parallel with the pivotal axis of the dog rocker, and a link pivoted at one end on a fixed part and connected at its other end by a pin and slot connection with the stepping dog.

19. In a typewriting machine, the combination of a power driven carriage; printing instrumentalities; finger keys therefor; and carriage escapement mechanism under control of said finger keys, said escapement mechanism including an escapement wheel, a dog rocker pivoted to turn on an axis parallel with the axis of the escapement wheel, a holding dog fixed to said dog rocker, a stepping dog pivoted on said dog rocker, the axis of the pivot of the stepping dog being parallel with the pivotal axis of the dog rocker, stops on the stepping dog and dog rocker to limit the movement of the stepping dog on the rocker, a spring connected at one end to the stepping dog, and a link pivoted at one end on a fixed part and connected at its other end by a pin and slot connection with the stepping dog.

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.