

A. W. SMITH.
TYPE WRITING MACHINE.
APPLICATION FILED DEC. 17, 1912.

1,061,639.

Patented May 13, 1913.

4 SHEETS—SHEET 1.

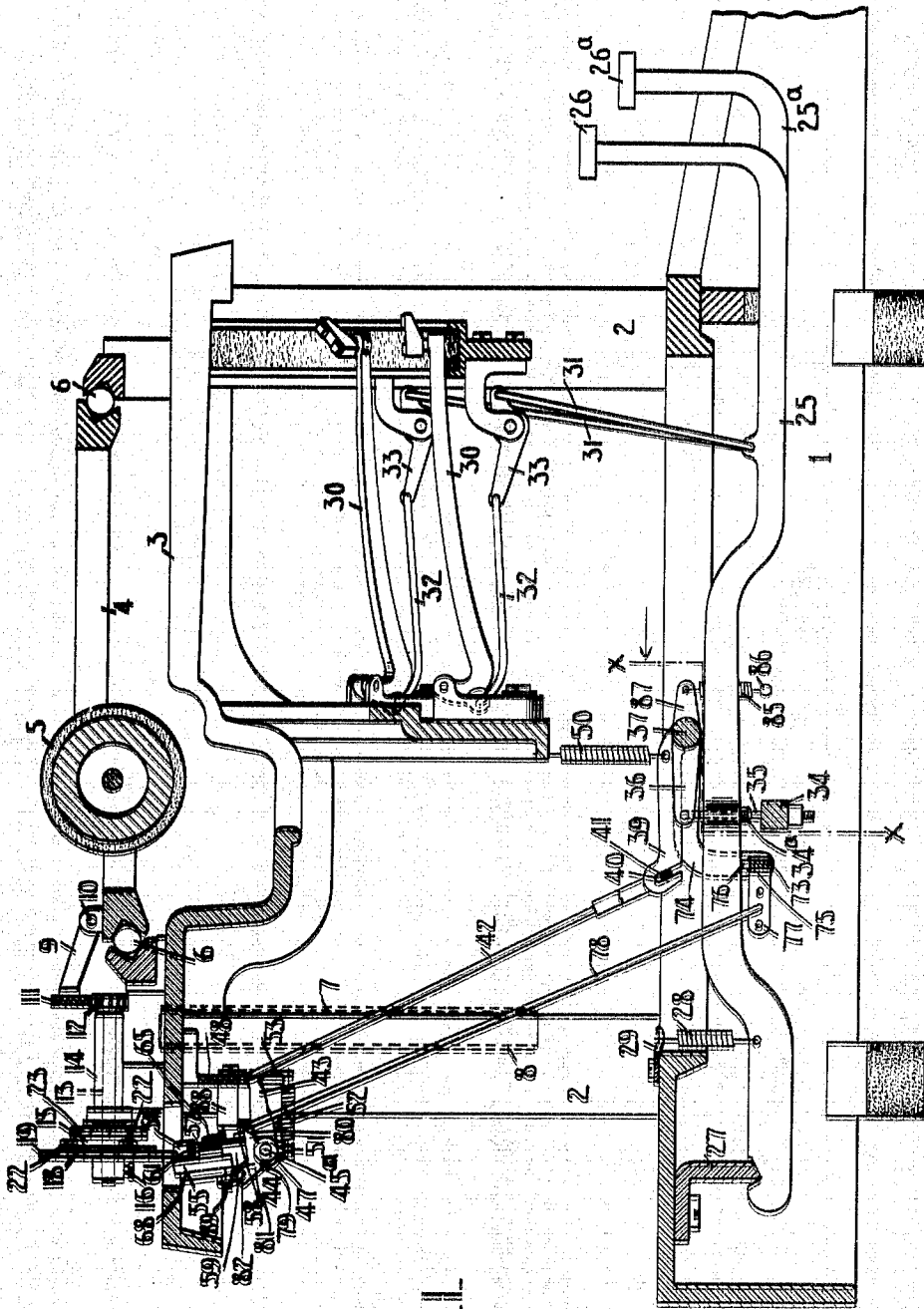


FIG. 1.

WITNESSES:

Mo. F. Hammer

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INVENTOR:

Arthur W. Smith

By Jacob F. Bell

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4 SHEETS—SHEET 2.

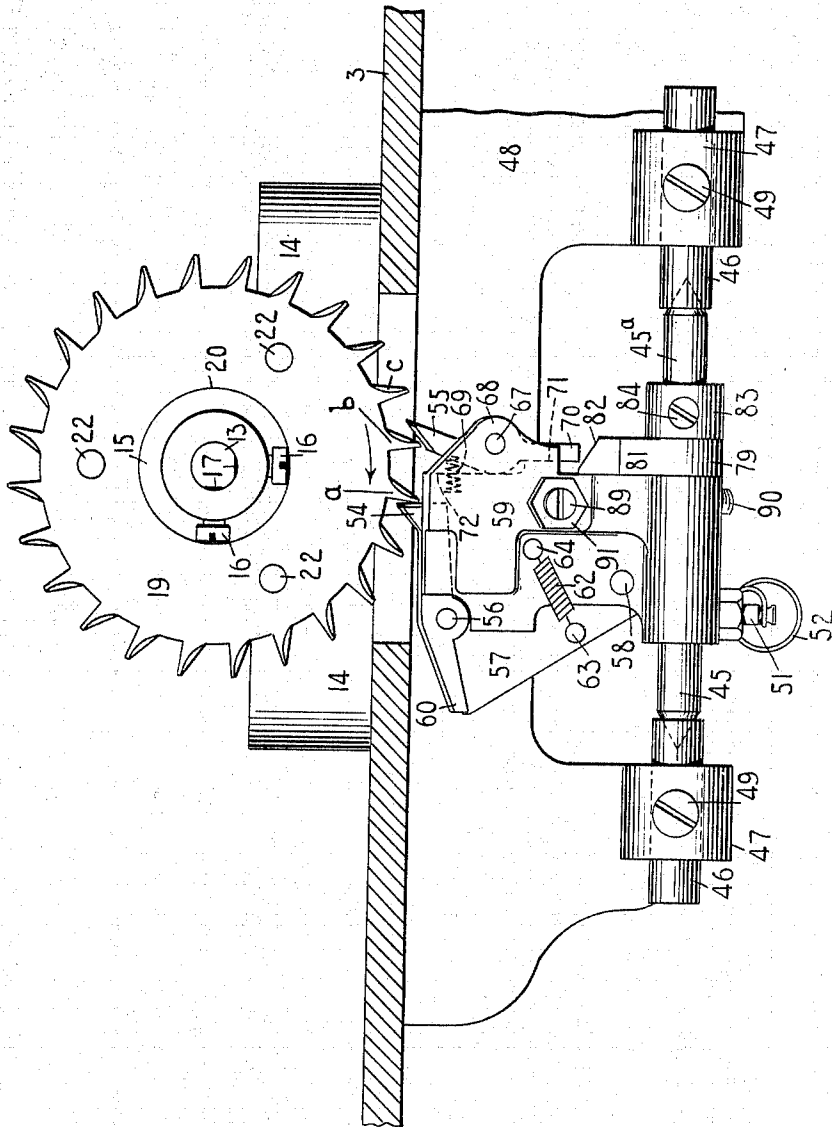


FIG. 2.

WITNESSES.

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4 SHEETS—SHEET 3.

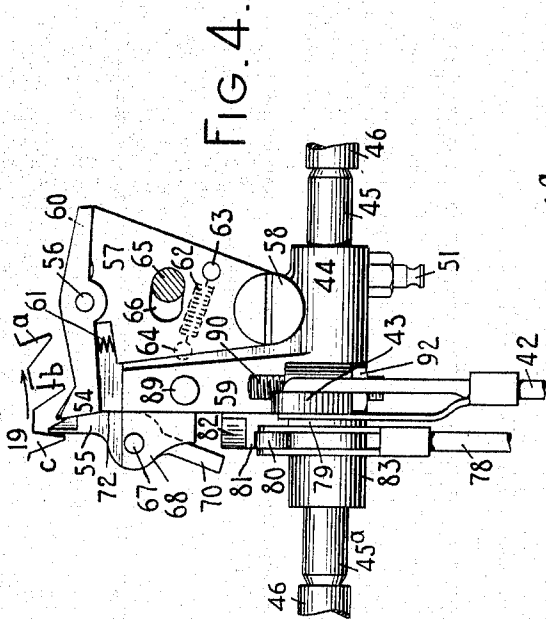


FIG. 4.

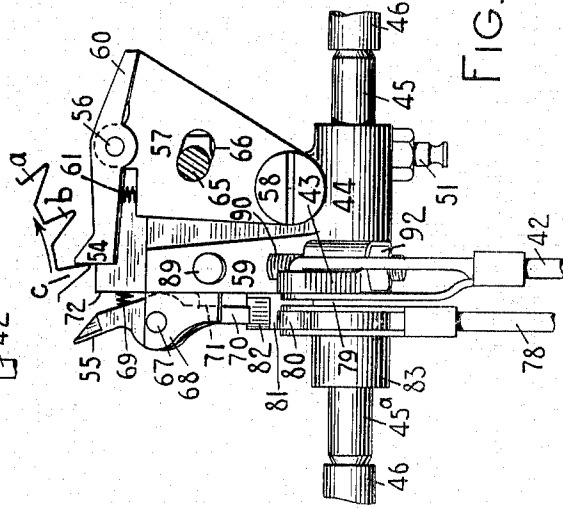


FIG. 5.

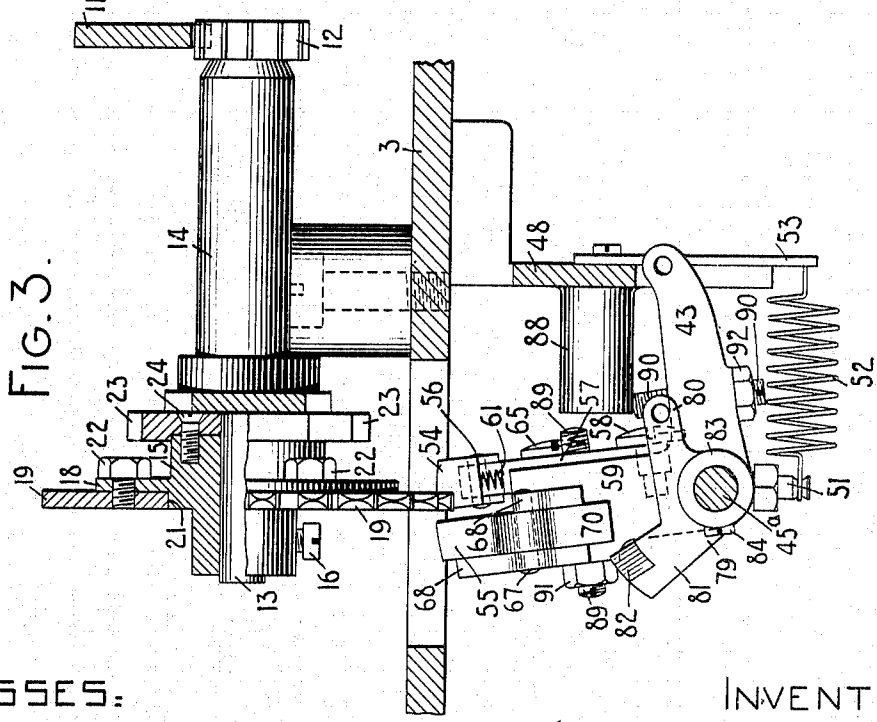


FIG. 3.

WITNESSES:

M. F. Hammer
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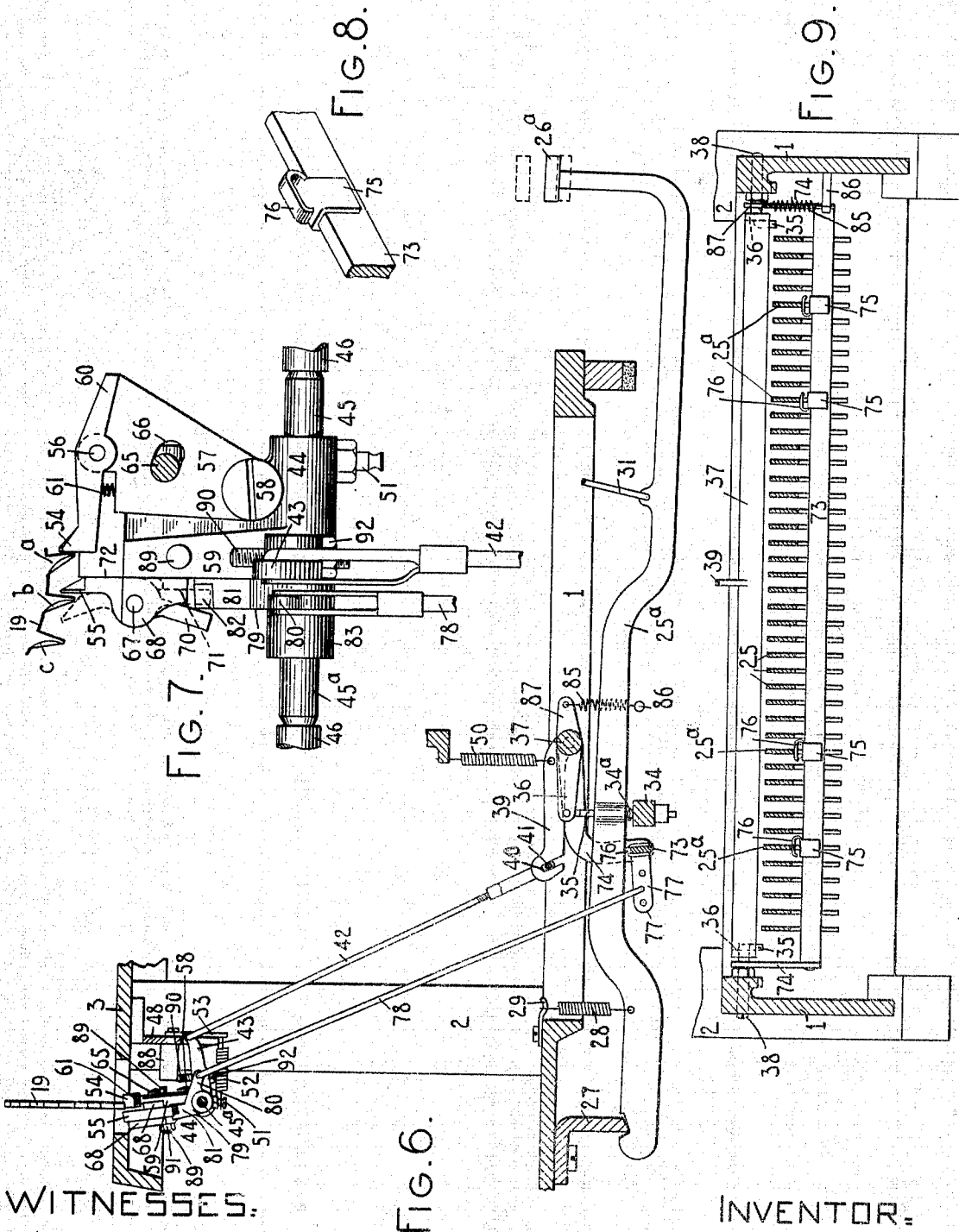
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1,061,639.

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4 SHEETS—SHEET 4.



WITNESSES:

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FIG. 6.

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UNITED STATES PATENT OFFICE.

ARTHUR W. SMITH, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO
REMINGTON TYPEWRITER COMPANY, OF ILION, NEW YORK, A CORPORATION OF
NEW YORK.

TYPE-WRITING MACHINE.

1,061,639.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed December 17, 1912. Serial No. 737,241.

To all whom it may concern:

Be it known that I, ARTHUR W. SMITH, a citizen of the United States, and resident of the borough of Manhattan, city of New York, in the county of New York and State of New York, 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 variable carriage-feed mechanism.

By my invention, as shown in the present instance, I provide carriage escapement mechanism which affords different extents of feed depending on the particular keys which are actuated so, for example, that a comparatively short feed of the carriage may be afforded when printing a character which occupies but little widthwise space and a comparatively long feed of the carriage is afforded when printing a character which occupies a greater widthwise space.

The main objects of my invention, generally stated, are to provide comparatively simple mechanism of the character specified and one which is efficient and reliable in action and can be readily introduced into existing forms of typewriting machines without modifying, or materially modifying, the structural features of said machines as they now exist.

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 description 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 fragmentary vertical fore and aft sectional view of a No. 10 or No. 11 Remington machine embodying my invention; although some of the parts are omitted and others that are shown are only conventionally represented. Fig. 2 is a fragmentary enlarged detail rear elevation, partly in section, of a portion of the escapement mechanism, the parts being shown as they appear when in the normal position, or position of rest. Fig. 3 is a side elevation of the same with parts in section. Fig. 4 is an enlarged detail fragmentary front elevation of a portion

of the escapement mechanism showing the parts disposed as they appear at the termination of the down stroke of a printing key that controls a type or types which require the greatest extent of carriage feed. Fig. 5 is a like view of the same showing the parts disposed as they appear after the key has been released and the parts are returned to normal position after having afforded a full letter feed movement of the carriage. Fig. 6 is a fragmentary vertical fore and aft sectional view of the escapement mechanism and some of the associated parts, the view showing the parts as they appear at the partial depression of one of the so-called half-space printing keys. Fig. 7 is an enlarged detail fragmentary front elevation of a portion of the same with parts in section, the view showing the parts disposed in the same positions that they occupy in Fig. 6. Fig. 8 is a fragmentary detail perspective view of the so-called auxiliary universal bar and one of the adjustable contact devices carried thereby. Fig. 9 is a transverse sectional view taken on the line $x-x$ of Fig. 1 and looking in the direction of the arrow at said line, the view showing the key levers and auxiliary universal bar.

I have shown my invention embodied in the present instance in a No. 10 or No. 11 Remington machine in which the invention may be readily included without modifying, or materially modifying, the structural features of said machines as they now exist, except in so far as some of the parts ordinarily employed may be replaced by those disclosed herein. It should be understood, however, that the invention may be embodied in various styles of typewriting machines and that various changes may be made to facilitate such embodiment of the invention.

The frame of the machine comprises a base 1, corner posts 2 and a top plate 3. A carriage 4 supports a rotative cylindrical platen 5 and is mounted on ball or roller bearings 6 for movement from side to side of the machine over the top plate thereof. The carriage is propelled in its letter feed movement from right to left by the usual spring drum 7 operatively connected with the carriage by a strap or band 8. Arms 9 are pivoted at 10 on the carriage and extend rearwardly therefrom where they are connected to a feed rack 11 which meshes with

the usual feed pinion 12. This feed pinion is fixed to the forward end of a shaft 13 which is mounted to turn in a bearing support 14 fixed to the top plate of the machine. From an inspection of Fig. 3 it will be seen that a hub-like member 15 is carried by the shaft 13 and is fixed thereto by set screws 16. These screws are received in tapped openings in the hub 15 and bear at their inner ends against flattened faces 17 (see Fig. 2) on the shaft 13. This hub-like member is therefore fixed to turn with the shaft 13. The hub is formed with a circumferential flange 18 and an escapement wheel or rack 19 is formed with a central opening 20 by which it may be received and supported on a circular shoulder 21 formed on the hub. Screws 22 extend through openings in the flange 18 and are received in tapped openings in the escapement wheel to rigidly secure the escapement wheel to the hub 15. A back spacing wheel 23 may be secured to the hub 15 by screws 24. It will be understood therefore that the shaft 13, hub 15, escapement wheel 19 and back spacing wheel 23 are all rigidly connected to turn together.

The type actions shown are such as those commonly employed in the No. 10 and No. 11 Remington machines. Thus the key actuated devices or key levers 25 and 25* have finger keys 26 and 26* and are fulcrumed on a fulcrum bar 27. The returning springs 28 are each connected at one end to a key lever and at its opposite end to a plate 29 secured to the base of the machine. Each key lever is connected to an upwardly and rearwardly striking type bar 30 through intermediate actuating links 31 and 32 and a sub-lever 33. The various type bars are segmentally arranged and adapted to move upwardly and rearwardly to strike against the front face of the platen.

Arranged transversely of the machine beneath the series of key levers is the ordinary universal bar 34 with which vertically adjustable contact screws 34* which are carried by the key levers are adapted to engage to actuate the universal bar. This universal bar is connected by upwardly extending links 35 to crank arms 36. These crank arms project rearwardly from a rock shaft 37 which is pivoted at its ends on bearing screws 38 (see Fig. 9) carried by the base of the machine. A centrally disposed rearwardly projecting crank arm 39 also projects from the rock shaft 37 and has a slot 40 in the rear end portion thereof. This slot receives a pin 41 which is carried by an upwardly and rearwardly projecting link 42, which latter is pivoted at its upper end to a forwardly projecting arm 43 of a dog rocker which is designated as a whole by the reference numeral 44. The trunnion-like pivots 45 and 45* of this dog rocker are received at their ends in bearing blocks 46

and these latter are supported in bearing openings in lugs 47 formed on a bracket-plate 48 supported on the top plate of the machine. Each bearing block 46 is held in place by a screw 49 received in a tapped opening in the associated lug 47 and bearing at its inner end against the associated bearing block 46. A contractile spring 50 is connected at one end to the type bar segment and at its opposite end to the crank arm 39 to return the universal bar and the parts connected therewith to normal position. The dog rocker is also provided with a returning spring to return it and the link 42 to normal position. Thus a depending pin 51 is carried by the dog rocker and is connected to one end of a contractile spring 52. The opposite end of this spring is connected to a plate or arm 53 which is carried by the bracket plate 48.

The dog rocker carries two loose dogs 54 and 55. The loose dog 55 is pivoted at 56 on a rocking member, plate or carrier 57 which is pivoted by means of a headed, shouldered, pivot screw 58 on an upwardly extending arm or supporting member 59 of the dog rocker. The tail piece 60 of the pivoted dog 54 is adapted to bear against the member 57 to limit the pivotal movement of the dog 54 in one direction around its pivot 56. An expansion spring 61 bears at one end against the member 57 and at its opposite end against the pivoted dog 54. This spring is arranged to the left of the pivot 56 and normally maintains the dog 54 in the uppermost position, shown in Fig. 7, for engagement with the teeth of the escapement wheel 19. The pivotal movement of the dog under pressure of this spring is limited by the tail of the dog abutting the member 57 on which the dog is pivoted. From an inspection of Figs. 2 and 4, it will be seen that a contractile spring 62 is connected at one end to a pin 63 which projects from the member 57 and is connected at its opposite end to a pin 64 which projects rearwardly from the upright arm 59 of the dog rocker. The power of this spring 62 tends to turn the member 57 from right to left, as the parts appear in Fig. 4, around its pivot 58. The pivotal movement of the member 57 is limited by a screw stop 65 carried by the arm 59 and received in a slot or opening 66 formed in the body of the member 57. The ends of the slot 66 cooperating with the stop pin 65 limit the pivotal movement of the dog carrying member 57 in opposite directions. Fig. 5 represents the parts as they appear when in the normal position and from which it will be seen that a tooth of the escapement wheel normally engages the dog 54 and holds it, and the carrier 57 on which it is mounted, in the right-hand position against the power of the spring 62. If a reverse movement be

given to the escapement wheel at this time it will merely result in the rear faces of the teeth of the escapement wheel engaging the rear inclined face of the feed dog 54, turning the dog on its pivot 56 against the pressure of the spring 61 as the teeth of the escapement wheel are successively brought into contact with the feed dog. The second feed dog 55 is pivoted at 67 between bearing lugs 68 which project from the upwardly extending arm 59 of the dog rocker. An expansion spring 69 is received at one end in an opening in the arm 59 and bears at its opposite end in a corresponding opening in the feed dog 55. The force of this spring is exerted to normally maintain the feed dog 55 in the position shown in Figs. 2 and 5. The tail piece 70 of this feed dog 55 extends downwardly from the pivot 67, and in the normal positions of the parts represented in Figs. 2 and 5, bears against an abutment 71 which is formed as a part of the rocker arm between the supporting lugs 68. The tail piece co-operating with this abutment limits the movement of the dog 55 from right to left, as the parts are shown in Fig. 5. The extent of movement of each loose dog preferably corresponds to about half of the full letter space movement of the carriage. The operation of the escapement to afford a full letter space movement is, therefore, to give a so-called half-and-half "drop", that is to say, a half letter-space drop of the carriage at the downstroke of the key and a half letter-space drop of the carriage on the upward movement of the key. Thus when a full letter-space printing key 26 is depressed the contact screw 34^a carried thereby, will engage the universal bar 34 and effect a rocking of the dog rocker through the intermediate connections 35, 37, 39 and 42. A forward movement of the dog rocker thus produced is effective to move the feed dog 54 out of engagement with the tooth *a* (Fig. 2) of the escapement wheel which was engaged thereby and to carry the loose dog 55 into the path of the second preceding tooth *c* of the escapement wheel, as will be understood from an inspection of Fig. 2. A release of the dog 54 thus effected enables the spring 62 to turn the supporting member 57, together with the dog 54 which is carried thereby, from a position such as is shown in Fig. 5 to a position corresponding to that represented in Fig. 4. In this last mentioned position the dog 54 will be so located as to engage the next advancing tooth of the escapement wheel when the dog rocker returns to normal position. The depression of the finger key which effected a release of the dog 54 in the manner described, also brought the loose dog 55 into the path of the second tooth *c* (Fig. 2) of the escapement wheel from that engaged by the dog 54.

The escapement wheel being thus released from control of the dog 54 advances under the power of the spring drum. This advance continues until the tooth *c* on the wheel to the right of the dog 55, as the parts appear in Fig. 2, engages the dog 55 and moves it against the pressure of its spring 69 until the dog is arrested through its engagement with a contact face 72 on the upright arm 59 of the dog rocker, as shown in Fig. 4. This figure shows the parts as they are disposed at the termination of the downstroke of a so-called full letter-space key 26. When pressure on this key is released the upright arm of the dog rocker moves rearwardly, thereby bringing the feed dog 54 into the path of the tooth *c* on the escapement wheel and disengaging the feed dog 55 from this tooth *c*. The power of the carriage spring, exerted through the escapement wheel, exerts its force against the dog 54 and returns it, together with its carrier 57, around the pivot 58 to normal position, as shown in Fig. 5. The feed dog 55 having been released from engagement with the tooth *c* is likewise returned by its spring 69 to normal position, as shown in Fig. 5. The movement of the dog 54 with its carrier 57 under the pressure of the escapement wheel to the position shown in Fig. 5 is effective to provide a half letter space movement of the carriage which is effected at the upstroke of the key. It will be seen therefore that, under the conditions described, a half letter space drop of the carriage is afforded at the downstroke of the key and a half letter space drop of the carriage is afforded at the upstroke of the key, thereby providing a half-and-half drop to the extent of a full letter-space at each actuation of a full letter space printing key 26.

In the present construction I have provided means for controlling the escapement so as to afford only a half letter space feed at each actuation of certain of the printing keys (designated by the reference numeral 26^a) instead of a full letter-space feed, as hereinbefore described. Thus some of the characters occupy less widthwise space than others, such, for example, as the letter "i." When a printing key 26^a is actuated, which controls the types on which one of these characters is formed, special controlling means are thrown into operation to provide for a letter space feed movement of the carriage of only, say, half the distance that is afforded by an actuation of the other or full letter-space keys 26. In order to accomplish this result I have provided an auxiliary universal bar 73, which extends beneath the series of key levers 25 in the rear of the universal bar 34. The auxiliary universal bar is connected at its ends to upwardly and forwardly extending arms or links 74 which are pivoted on the pivot screws 38, which screws

likewise constitute pivots for the rock shaft 37. The universal bar 73 is provided with one or more substantially U-shaped clips 75 of which is adapted to straddle and be held friction tight on the universal bar, as shown in Fig. 8. Each of these clips is provided with an upwardly extending contact portion or projection 76 which may be bent up from the body portion of the clip and occupies a widthwise space sufficient to co-act with only one of the key levers 25 and 25^a, as shown in Fig. 9. There are four of these contact devices shown in Fig. 9 although this number may be varied as desired and the contact devices may be adjusted longitudinally of the auxiliary universal bar on which they are supported so as to bring the contact devices beneath different key levers if desired. It will be seen from an inspection of Fig. 9 that the key levers 25 which do not coöperate with the contact devices are free to be depressed to a considerable extent without bringing the key levers into engagement with the auxiliary universal bar. However, those key levers 25^a which co-act with the contact devices 76 have no such lost motion, since the space between them and the auxiliary universal bar is occupied by the contact devices. It will be understood, therefore, that a depression of any of these key levers 25^a will immediately effect a corresponding movement of the auxiliary universal bar through the engagement of any of such key levers with the associated projection or contact device 76.

The auxiliary universal bar carries a rearwardly projecting arm 77 to which an upwardly extending link 78 is pivoted. The upper end of this link is pivoted to a so-called controlling member or wedging device which is designated as a whole by the reference numeral 79. This device is provided with a forwardly projecting arm 80 to which the link 78 is connected and with an upwardly extending arm 81 provided with an inclined face or wedging portion 82. The controlling device or member 79 is pivoted to turn freely on the trunnion-like projection or pivot 45^a of the dog rocker, and to receive a pivotal movement on the axis of the dog rocker. The controlling device 79 bears at one side against the upright arm 59 of the dog rocker and a sleeve or collar 83 bears against the opposite side of the controlling member to hold it against movement longitudinally of the trunnion 45^a in one direction, the arm 59 of the dog rocker preventing a movement of the controlling member in the opposite direction. The collar 83 is fixed to the trunnion 45^a by a set screw 84 received in a tapped opening in the collar and bearing at its inner end against the trunnion 45^a.

The controlling member 79 has a pivotal

movement with and independently of the dog rocker. A forward independent movement of the controlling member is effective to bring the inclined face 82 thereon into engagement with the tail piece 70 of the loose dog 55. This results in turning the loose dog on its pivot 67 toward the dog 54 and bringing the dog 55 into engagement with the contact face 72 on the arm 59 of the dog rocker, as shown in Fig. 7. This camming or wedging of the loose dog into engagement with the contact face 72 is effected by a movement of the controlling member or wedge between the tail piece 70 of the dog and the arm 59, as shown in Fig. 7. The loose dog being thus positioned and held by the wedging device no longer acts as a loose dog but is maintained fixed against movement around its pivot 67, and temporarily constitutes in effect a fixed dog. The construction and arrangement of the parts are such that a depression of one of the so-called half space printing keys 26^a to the full line position shown in Fig. 6, is effective to actuate the auxiliary universal bar 73 to turn the controlling device 79 from its normal position shown in Fig. 1 to the position shown in Fig. 6, where the wedge has effected a movement of the dog 55 from the normal position shown in Fig. 5 to that represented in Fig. 7. This movement of the dog 55 carries it back its full extent of movement, or approximately a distance between two teeth of the escapement wheel, so that it is adapted to co-act with the next advancing tooth *b* (Fig. 7) of the escapement wheel on the full depression of the printing key 26^a without affording a drop of the carriage for approximately a half letter space distance, as previously described. This will be understood from an inspection of Fig. 7 which shows the positions of the parts after the dog 55 has been cammed against the dog rocker to take up the lost motion that the dog ordinarily has, thus preventing the partial letter space drop of the carriage that is ordinarily effected by such lost motion. It should be understood that the depression of the printing key 26^a to the full line position shown in Fig. 6 is effective as hereinbefore explained to actuate the controlling device and move the dog 55 to the Fig. 7 position, and that this movement of the dog is effected before motion is transmitted from the same key to the universal bar 34. It will be seen, therefore, that the dog 55 is moved to the Fig. 7 position before the dog rocker has received a forward rocking movement to disengage the normally engaged feed dog 54 from the escapement wheel. When, however, the movement of the feed dog 55 around its pivot 67 is completed the universal bar 34 will be taken up, and the dog rocker will receive a pivotal movement to disengage the dog 54 and bring the dog 55

into the path of the next advancing tooth *b* (Fig. 7) on the escapement wheel without, however, affording a drop, or any material extent of drop, to the carriage. It follows, therefore, that there is no feed movement of the carriage during the downstroke of the key under the conditions mentioned. It should be understood that after the universal bar 73 has been taken up in the manner described, the controlling device 79 moves with the dog rocker, and on the same pivotal center as the dog rocker, and is thus maintained wedged between the tail of the dog 55 and the upright arm 59 of the dog rocker. The downstroke of the key which was effective to interpose the dog 55 in the path of the next advancing tooth *b* of the escapement wheel was also effective to release the dog 54, and the spring 62 then moved the member 57 and thus advanced the dog 54 to a position corresponding to that indicated in Fig. 4. It follows, therefore, that when pressure is released on the depressed finger key the various springs hereinbefore referred to will return the type action, universal bar 34, and dog rocker to normal position, and the dog 54 will be again engaged by the next advancing tooth of the escapement wheel, which latter when released by the dog 55 will force the dog 54 and its carrier 57 against the pull of the spring 62 to the position shown in Fig. 5, thus affording half of a full letter-space drop of the carriage through a movement of the dog 54 with its carrier 57.

A separate returning spring 85 is connected to return the universal bar 73 and the parts controlled thereby to normal position. Thus this spring 85 is connected at one end to a pin 86 which projects from the base of the machine, said spring being connected at its opposite end to an arm 87 which is formed as a part of and projects forwardly from one of the arms 74. The force of this spring is exerted to elevate the universal bar 73 and return the controlling device 79 to its normal position, shown in Fig. 1, where it is withdrawn from between the tail 70 of the dog 55 and the body portion of the dog rocker. The dog 55 being thus freed from the wedging device is returned by the spring 69 to its normal position, shown in Fig. 5. It will be understood that when the so-called half letter-space key 26^a is released, the universal bars 34 and 73 will move upwardly together until the dog rocker returns to normal position and the feed dog 55 has been disengaged from the escapement wheel, and the feed dog 54 has been reengaged therewith. After this has been effected the universal bar 73 will continue its upward movement with the returning key lever 25^a under the force of the spring 85. This independent movement of the universal bar 73 is effective to turn the controlling de-

vice 79 on its pivotal center independently of the dog rocker which has been arrested. It is this independent movement of the controlling device that enables the feed dog 55 to be returned to normal position around its pivot 67.

It should be understood from the foregoing description that during the operation of the full space printing keys 26 the universal bar 73 will not be taken up and actuated, or will not be actuated to a sufficient extent to interpose the wedging or controlling device 79 between the tail of the dog 55 and the dog rocker; but that the controlling device and dog rocker will be moved together while the controlling device remains in the inoperative position. When, however, a so-called half letter-space printing key 26^a is depressed the associated contact device or projection 76 causes the universal bar 73 to be actuated first, thereby wedging the dog 55 against the dog rocker and taking up the lost motion that is ordinarily provided for this dog and causing it to act as a fixed dog, so that a feed movement of the carriage will at this time be effected only through the movement of the dog 54 with its carrier 57 around the pivot 58. It will be seen, therefore, that during the actuation of each so-called full letter-space key 26 the wedging device is not thrown into operation, but on the other hand each time a so-called half letter-space printing key 26^a is actuated the wedging device will be thrown into operation to provide for a half letter-space only at each printing operation.

The rocking movement of the dog rocker is limited by a fixed stop or abutment 88 which projects rearwardly from the bracket plate 48. Screw stops 89 and 90 are carried by the dog rocker and co-act with the fixed stop 88. The screw 89 passes through a tapped opening in the upright arm 59 of the dog rocker and is locked in its adjusted position by a lock nut 91. The forward end of this screw co-acts with the rear end of the fixed stop 88 to limit the forward movement of the dog rocker on the depression of a key. The screw stop 90 is received in and extends through a tapped opening in the arm 43 of the dog rocker and the upper end of said screw stop co-acts with the fixed stop 88 to limit the rearward movement of the dog rocker. A lock nut 92 co-acts with the screw stop 90 to hold it against accidental displacement from its adjusted position.

From the foregoing description it will be understood that while all of the key levers are operative to actuate the dog rocker, certain only of the key levers are operative to move the controlling device 79 independently of the dog rocker; that at each actuation of the dog under control of a half letter-space key 26^a, and after a printing operation has been effected by such key, the dog 55

will return to the normal position, shown in Figs. 2 and 5, where it is ready to act as a loose dog and afford a full letter-space movement of the carriage at the next actuation of a full letter-space key 26; that there being
 5 comparatively few keys 26^a, which control the escapement to give a short or half letter-space feed of the carriage, the escapement operates under normal conditions by the control of the full space keys 26 to afford a full
 10 letter-space feed, whereas when one of the so-called half letter-space keys 26^a is depressed, the universal bar 73 and the controlling device 97 will be actuated to provide
 15 an abnormal operation to afford only a half letter-space feed of the carriage.

While I have referred herein to a variation in the extent of feed of the carriage from a half to a full letter space it should be understood that these terms may be regarded
 20 merely as relative terms, and that the escapement may be arranged to afford different extents of feed, and different extents of variation may be provided.

25 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:—

30 1. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism including a feed dog operative at one time as a loose dog and at another
 35 time as a fixed dog, and controlling means controlled by certain only of said printing keys for controlling said feed dog to operate as a fixed dog and controlled by certain other of the printing keys to control
 40 said dog to operate as a loose dog.

2. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism including a normally loose feed
 45 dog operative at one time as a loose dog and at another time as a fixed dog, and controlling means operative by certain only of said printing keys for moving said dog and taking up the movement that it normally has
 50 as a loose dog and causing it to operate as a fixed dog, said controlling means being operative by certain other of said keys to control said dog to operate as a loose dog.

3. In a typewriting machine, the combination of a power driven carriage, an escapement rack, a dog rocker, a dog carried thereby, a second normally loose dog also
 55 carried by the dog rocker, printing keys, means controlled by said keys for controlling the movement of said dog rocker, and independent means controlled by certain only of said keys for rendering said second normally loose dog operative as a fixed dog.
 60

4. In a typewriting machine, the combination of a power driven carriage, an escape-

ment rack, a dog rocker, a dog carried thereby, a second normally loose dog also carried by said rocker, printing keys, means controlled by said keys for controlling the movement of said dog rocker, and independent means controlled by certain only of said
 70 keys for taking up the movement that said dog normally has as a loose dog and causing it to operate as a fixed dog.

5. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism including a feed dog operative at one time as a loose dog and at another
 75 time as a fixed dog, controlling means controlled by certain only of said printing keys for controlling said feed dog to operate as a fixed dog and by certain other of the printing keys to operate as a loose dog, and means for returning said controlling means
 80 to normal position after each printing operation to enable said feed dog to operate as a loose dog.

6. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism including a normally loose feed
 85 dog operated at one time as a loose dog and at another time as a fixed dog, controlling means operative by certain only of said printing keys for moving said dog and taking up the movement that it normally has as a loose dog and causing it to operate as
 90 a fixed dog and operative by certain other of said keys as a loose dog, and means for returning said controlling means to normal position after each printing operation to enable the normally loose dog to return to the position where it is operative to act as
 95 such.

7. In a typewriting machine, the combination of a power driven carriage, an escapement rack, a dog rocker, a feed dog carried thereby, a second normally loose dog also
 100 carried by the rocker, printing keys, means controlled by said keys for controlling the movement of said dog rocker, independent means controlled by certain only of said keys for rendering said second normally loose dog operative as a fixed dog, and
 105 means for returning said independent means to normal position after each printing operation to enable said normally loose dog to act as such.

8. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising an escapement rack, two normally loose dogs which coöperate
 110 with said rack, and controlling means controlled by certain only of said printing keys for controlling one of said dogs to act as a fixed dog.
 115

9. In a typewriting machine, the combination of a power driven carriage; printing
 120

keys; and variable feed carriage escapement mechanism comprising an escapement rack, two normally loose dogs which cooperate with said rack, each dog normally affording a drop of the carriage, and controlling means controlled by certain only of said printing keys to take up the movement of one of said dogs and to cause it to act as a fixed dog, thereby affording a drop of the carriage only through the other dog.

10. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising an escapement rack, two normally loose dogs which cooperate with said rack, each dog when operating as a loose dog affording substantially the same extent of drop of the carriage, and controlling means controlled by certain only of said printing keys for taking up the movement of one of said dogs and causing it to act as a fixed dog, thereby affording at such time only substantially one half the extent of feed that the carriage receives when both dogs operate as loose dogs.

11. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising an escapement rack, two normally loose dogs which cooperate with said rack, controlling means controlled by certain only of said printing keys for controlling one of said dogs to act as a fixed dog, and means for returning said controlling means to normal position after each printing operation to enable both dogs to operate as loose dogs.

12. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising an escapement rack, two normally loose dogs which cooperate with said rack, each dog normally affording a drop of the carriage, controlling means controlled by certain only of said printing keys to take up the movement of one of said dogs and to cause it to act as a fixed dog, thereby affording a drop of the carriage only through the other dog, and means for returning said controlling means to normal position after each printing operation to enable a drop of the carriage to be effected through both dogs.

13. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising an escapement rack, two normally loose dogs which cooperate with said rack, each dog when operating as a loose dog affording substantially the same extent of drop of the carriage, controlling means controlled by certain only of said printing keys for taking up the movement of one of said dogs and causing it to act as a fixed dog, thereby affording at such

time only substantially one half the extent of feed that the carriage receives when both dogs operate as loose dogs, and means for returning said controlling means to normal position after each printing operation to enable both dogs to operate as loose dogs.

14. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising a dog rocker, a feed dog carried thereby, said feed dog being operative at one time as a loose dog and at another time as a fixed dog, a universal bar operative by any of said printing keys and operatively connected to said dog rocker to actuate it, a second universal bar operative by certain only of said printing keys, and means operative by said second universal bar for controlling said feed dog to operate as a fixed dog.

15. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising a dog rocker, a normally loose feed dog carried thereby, said feed dog being operative at one time as a loose dog and at another time as a fixed dog, a universal bar operative by any of said printing keys and operatively connected to said dog rocker to actuate it, a second universal bar operative by certain only of said printing keys, and controlling means controlled by said second universal bar for moving said dog to take up the movement that it normally has as a loose dog.

16. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising a dog rocker, two normally loose feed dogs carried thereby, a universal bar operative by any of said printing keys and operatively connected to said dog rocker to actuate it, a second universal bar operative by certain only of said printing keys, and controlling means operated by said second universal bar to control one of said dogs to operate as a fixed dog.

17. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising a dog rocker, two normally loose feed dogs carried thereby, each dog when operating as a loose dog affording substantially the same extent of drop of the carriage, a universal bar operative by any of said printing keys and operatively connected to said dog rocker to actuate it, a second universal bar operative by certain only of said printing keys, and controlling means operated by said second universal bar for taking up the movement of one of said dogs and causing it to act as a fixed dog, thereby affording a drop of the carriage only through the other dog.

18. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising a dog rocker, two normally loose feed dogs carried thereby, each dog when operating as a loose dog affording substantially the same extent of drop of the carriage, a universal bar operative by any of said printing keys and operatively connected to said dog rocker to actuate it, a second universal bar operative by certain only of said printing keys, and controlling means operated by said second universal bar for taking up the movement of one of said dogs and causing it to act as a fixed dog, thereby affording at such time only substantially one half the extent of feed that the carriage receives when both dogs operate as loose dogs.

19. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism therefor comprising a dog rocker, a normally loose dog carried thereby and movable independently thereof, said dog operating at one time as a fixed dog and at another time as a loose dog, means controlled by said printing keys for actuating said dog rocker, and a wedging device controlled by certain only of said printing keys and coöperative with said dog to hold it against independent movement so as to cause the dog to act as a fixed dog.

20. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism therefor comprising a dog rocker, a normally loose dog carried thereby and movable independently thereof, said dog operating at one time as a fixed dog and at another time as a loose dog, means controlled by said printing keys for actuating said dog rocker, a wedging device movable with and independently of said dog rocker, and means controlled by certain only of said printing keys for controlling the independent movement of said wedging device to throw it into coöperation with said dog to effect a movement thereof independently of the dog rocker and thereafter hold the dog against independent movement so as to cause it to act as a fixed dog.

21. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism therefor comprising a dog rocker, a pair of normally loose dogs carried thereby and normally spaced apart, means controlled by said printing keys for actuating said dog rocker, and means controlled by certain only of said printing keys for moving one of said dogs toward the other to reduce the space between the dogs.

22. In a typewriting machine, the combination of a power driven carriage; printing

keys; and variable feed carriage escapement mechanism therefor comprising a dog rocker, a pair of normally loose dogs carried thereby and normally spaced apart, means controlled by said printing keys for actuating said dog rocker, a wedging device movable with and independently of said dog rocker and operative by such independent movement on one of said dogs to move it toward the other; and means controlled by certain only of said printing keys for effecting an independent movement of said wedging device.

23. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism therefor comprising a dog rocker, a pair of normally loose dogs carried thereby and normally spaced apart, a universal bar controlled by said printing keys and operatively connected to said dog rocker to actuate it, a wedging device movable with and independently of said dog rocker and operative by such independent movement to hold one of the normally loose dogs to cause it to operate as a fixed dog, a second universal bar controlled by certain only of said printing keys, and intermediate connections between said second universal bar and said wedging device to control the independent movement of the latter.

24. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising a universal bar the actuation of which determines when a variation in the normal extent of feed is to be afforded, actuating devices controlled by said printing keys, and adjustable contact devices interposed between said actuating devices and said universal bar and an adjustment of which contact devices enables one or another of the keys to actuate said universal bar through an interposed contact device.

25. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising a universal bar the actuation of which determines when a variation in the normal extent of feed is to be afforded, actuating devices controlled by said printing keys, and contact devices carried by and adjustable along said universal bar to bring each of said devices into coöperative relation with one or another of said key controlled actuating devices.

26. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising a universal bar the actuation of which determines when a variation in the normal extent of feed is to be

afforded, actuating devices controlled by said printing keys, substantially U-shaped clips which straddle the universal bar and are adjustable to different positions along the same, and a projecting contact device carried by each of said clips for coöperation with one of said key actuated devices, the adjustment of the clips along the universal bar determining with which key controlled actuating devices the contact devices on the clips shall coöperate.

27. In a typewriting machine, the combination of printing key levers; a power driven carriage; and variable feed carriage escapement mechanism affording different extents of feed depending on which of the key levers are actuated, said escapement mechanism comprising a universal bar controlled by any of said key levers, escapement devices controlled thereby, a second universal bar controlled by certain only of said key levers, controlling means actuated by said second universal bar, and contact devices carried by and adjustable along said second universal bar and with each of which a key lever is adapted to coöperate, the adjustment of said contact devices determining

which of the key levers shall coöperate therewith.

28. In a typewriting machine, the combination of a power driven carriage; printing keys; and variable feed carriage escapement mechanism comprising a dog rocker, a feed dog carried thereby, said feed dog being operative at one time as a loose dog and at another time as a fixed dog, a universal bar operative by any of said printing keys and operatively connected to said dog rocker to actuate it, a second universal bar operative by certain only of said printing keys, and controlling means which determines whether the said dog shall be operative as a fixed dog or as a loose dog, said controlling means being under control of said second universal bar.

Signed in the borough of Manhattan, city of New York, in the county of New York and State of New York, this 16th day of Dec., A. D. 1912.

ARTHUR W. SMITH.

Witnesses:

CHARLES E. SMITH,
M. F. HANNWEBER.