

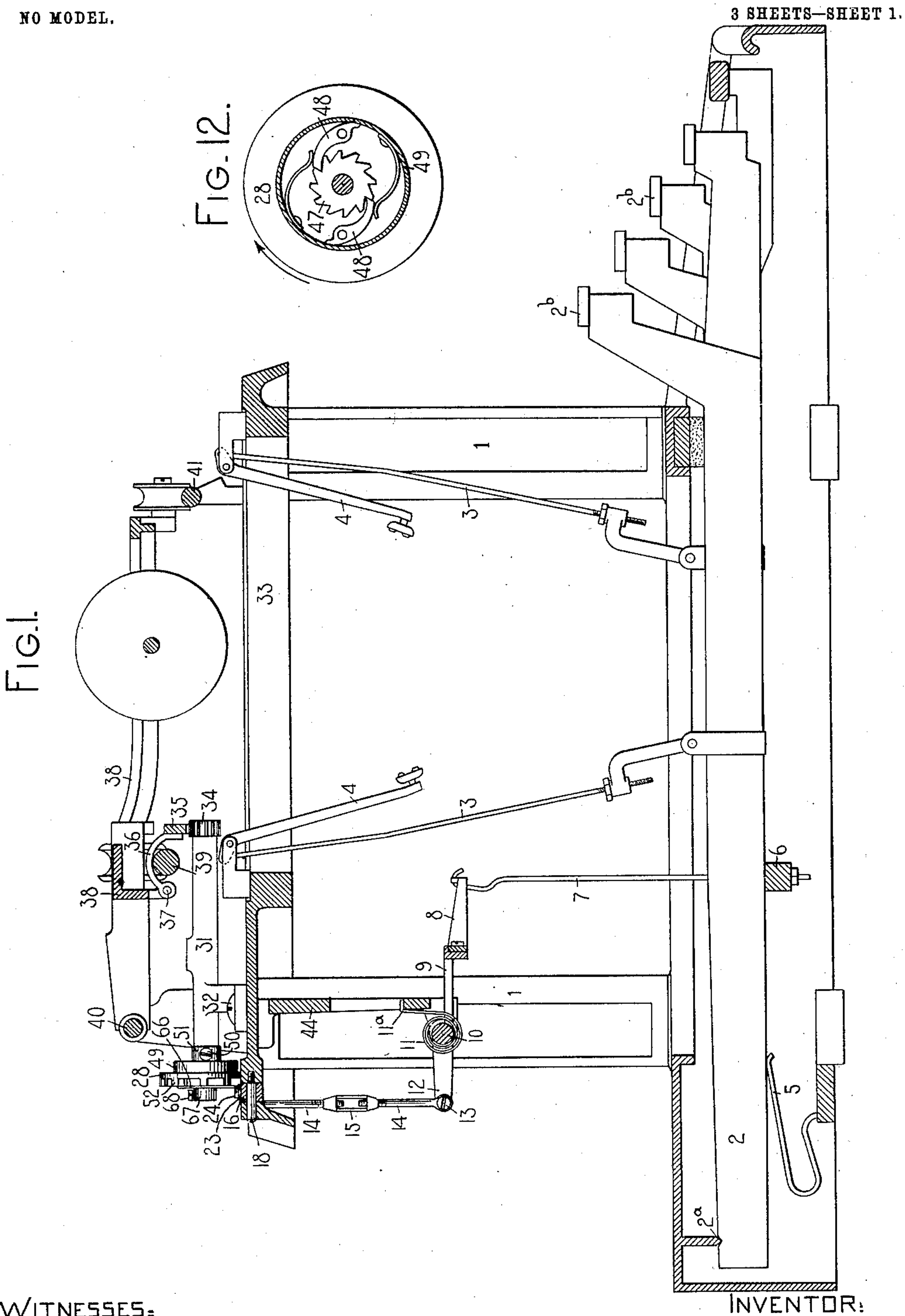
No. 737,786.

PATENTED SEPT. 1, 1903.

C. H. SHEPARD.  
TYPE WRITING MACHINE.  
APPLICATION FILED JULY 18, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

*R. V. Donovan.*  
*Charles Smith*

INVENTOR:

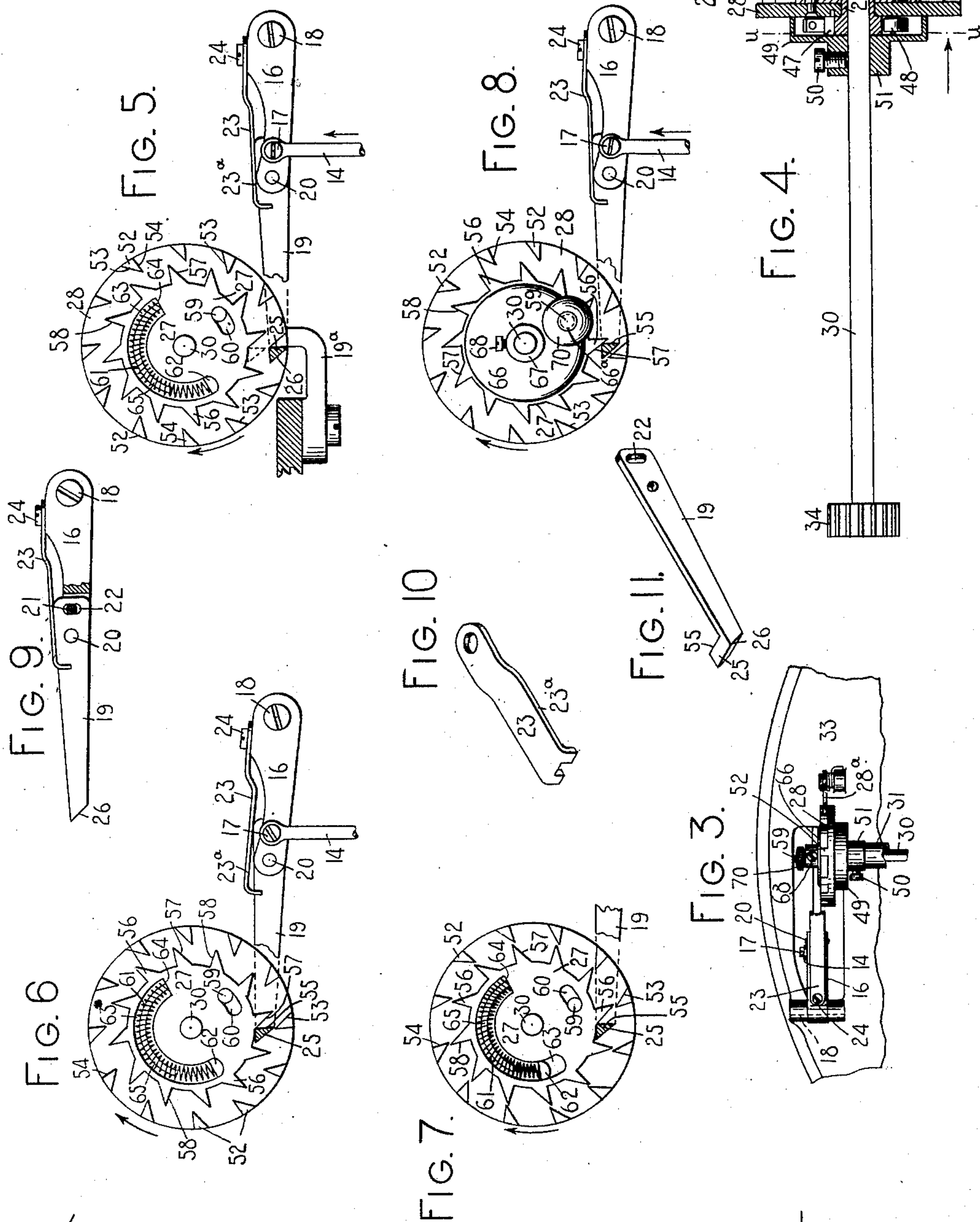
*Chas. H. Shepard*  
by *Jacob Felbel*  
HIS ATTORNEY.



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3 SHEETS-SHEET 3.



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*Charles Smith*

INVENTOR:

*Chas. H. Shepard*  
by *Jacob Falbel*  
HIS ATTORNEY



# UNITED STATES PATENT OFFICE.

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## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 737,786, dated September 1, 1903.

Application filed July 18, 1902. Serial No. 116,048. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. SHEPARD, a citizen of the United States, and a resident of the borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My present invention is directed to escapement mechanism for type-writing machines; and the object of said invention is to provide a simple, easy-acting, speedy, and efficient escapement mechanism.

A further object of my invention is to provide an efficient escapement which may be readily regulated to effect an "ordinary" or "reverse" feed at will; and to these ends my invention consists in the features of construction, arrangements of parts, and combinations of devices to be hereinafter described and claimed.

In the accompanying drawings, wherein like reference characters represent corresponding parts with the various views, Figure 1 is a central vertical sectional view of one form of type-writing machine embodying my invention, the section being taken from front to rear of the machine. Fig. 2 is a rear elevation of the same with parts broken away and with parts in section. Fig. 3 is a fragmentary top view of escapement devices. Fig. 4 is an enlarged detail transverse sectional view of the feed or escapement wheels, the view illustrating the connection thereof with the feed shaft and pinion. Fig. 5 is an enlarged detail rear elevation of the escapement or feed wheels and the cooperating feed-dog with the cover-plate and thumb-nut removed, the view illustrating in full lines the normal disposition of the parts when set for either ordinary or reverse feed. Fig. 6 is a like view of the same, illustrating the disposition of the parts when set for ordinary feed and at a full depression of a key. Fig. 7 is a like view of the same, illustrating the disposition of the parts when set for reverse feed and at a full depression of the key. Fig. 8 is an enlarged detail rear elevation of the escapement-wheels and feed-dog with the cover-plate and thumb-nut in place, the view

illustrating the disposition of the parts when set for ordinary feed and during the return of the feed-dog to the normal position. Fig. 9 is a detail side view of the feed-dog and its carrier with parts broken away. Fig. 10 is a detail perspective view of the spring which normally maintains a fixed relation between the feed-dog and its carrier. Fig. 11 is a detail perspective view of the feed-dog. Fig. 12 is a transverse sectional view of a portion of the carriage-feed mechanism, the view being taken on the line *u u* of Fig. 4 and looking in the direction of the arrow at said line.

In the various views parts have been omitted and other parts broken away to more clearly illustrate the structure.

I have illustrated my invention in its application to a No. 6 Remington machine, though it should be understood that the invention or any of the separate features thereof may be applied to different characters of type-writing machines and that to this end various changes may be made in the construction and operation of the parts shown without departing from the spirit of the invention.

In the drawings, 1 indicates the framing of the machine, in which the key-levers 2 are fulcrumed at 2<sup>a</sup> and have the usual finger-keys 2<sup>b</sup> and are restored to the normal position by springs 5. Each key-lever is connected by a link 3 to a type-bar 4 in the usual manner. Extending beneath the key-levers 2 is a universal bar 6, which is connected at its ends to links 7, which in turn are connected to a transverse bar 8, that is secured to an arm 9, which projects from a rock-shaft 10, that is restored to the normal position by a spring 11, connected at one end, 11<sup>a</sup>, to a plate-like bracket that is secured to the frame 1 and at its opposite end, 11<sup>b</sup>, to a collar fixed to the shaft 10.

The rock-shaft 10 is provided with a rearwardly-extending arm 12, which is connected at 13 to a two-part link 14, the separate parts of which have oppositely-turned screw-threads that cooperate with corresponding screw-threads in a turnbuckle 15 to vary the length of the link, and thus change the throw imparted to the feed-dog carrier 16, which is pivoted at 17 to the upper end of said link.



The feed-dog carrier is pivoted at 18 to the frame of the machine and has a feed-dog 19 pivoted thereto at 20, the downward movement of the dog being limited by a fixed stop 19<sup>a</sup>, Fig. 5. Upon reference to Fig. 9 it will be observed that the feed-dog carrier may have a limited movement with relation to the free end of the feed-dog and around the pivot 18, which connects the dog-carrier to the frame. This limited independent movement of the carrier and feed-dog is permitted by the pin-and-slot connection between the two, the pin 21 being carried by the carrier and extending through an elongated opening or slot 22 in the feed-dog. The feed-dog and carrier are maintained normally in a fixed relation to each other by a spring 23, that is connected to the feed-dog carrier at 24 and bears at its under flat face 23<sup>a</sup> on the top of the feed-dog and at both sides of the pivot 20, which connects the feed-dog to its carrier. The pressure of the spring 23 normally maintains the parts in the position illustrated in Fig. 9, with the pin 21 centered in the slot 22, for purposes which will hereinafter appear. The end of the feed-dog 19 extends at 25 at right angles to the body thereof and is provided with a beveled face 26. The angular end of the feed-dog coöperates with the teeth on the feed or escapement wheels 27 and 28, and as it vibrates back and forth between these teeth it will effect a feed movement of the carriage, as will hereinafter more clearly appear. The feed-wheel 28 is fixed to a sleeve 29, Fig. 4, that is loosely seated on a shaft 30, mounted in a suitable bearing 31, secured at 32 to the top plate 33 of the machine. The forward end of this rock-shaft 30 is provided with a feed-pinion 34, which meshes with a feed-rack 35, carried by arms 36, which are pivoted at 37 to the carriage 38, that moves upon traverse-rods 39 40, and a shift-rod 41. The carriage is moved in the direction of its feed by a spring-drum 42, that is mounted to revolve upon a spindle 43, carried by a bracket-plate 44, secured to the frame 1 of the machine. This spring-drum is connected to one end of a strap or band 45, which has its opposite end connected to a hook 46, that extends downwardly from the carriage 38.

The sleeve 29, Fig. 4, hereinbefore referred to, is provided with an integral ratchet-wheel 47, (see Figs. 4 and 12,) that coöperates with spring-pressed pawls 48, that are pivoted to a cylindrical housing 49, which is secured to the shaft 30 by a set-screw 50, which passes through a threaded opening in the collar 51 of the housing and bears at its inner end against the shaft 30. The construction of this housing and the pawl-and-ratchet arrangement referred to is somewhat similar to that employed in the No. 6 Remington machine and enables the escapement-wheel to remain fixed while the carriage is being moved from left to right and constitutes an operative connection between the escapement-wheel and the feed-pinion to produce

an intermittent feed movement of the carriage when the escapement-wheels are operated. A spring-pressed back-stop pawl 28<sup>a</sup> coöperates with the teeth of the wheel 28 to prevent an accidental reverse rotation or displacement of the wheel when the carriage is moved to the right. The escapement-wheel 28 is provided with crown-teeth 52, that extend laterally from one face thereof and each of which has a beveled face 53 and a substantially straight or radial face 54, that coöperates with the straight face 55 on the feed-dog. The escapement-wheel 27 is loosely mounted upon the sleeve 29, hereinbefore referred to, and is preferably contained within the line of crown-teeth on the escapement-wheel 28, so that the teeth of both escapement-wheels are in substantially the same plane. The escapement-wheel 27 is provided with peripheral teeth 56, each of which is beveled upon one face 57 and is provided with a straight or radial face 58. The feed-wheel 27 has a limited movement of rotation with relation to the escapement-wheel 28 under certain conditions, and the limit of this movement is controlled by a pin 59, carried by the escapement-wheel 28 and extending through a slot 60 in the escapement-wheel 27. (See Figs. 5 and 7.) This pin-and-slot connection permits an extent of independent movement of the escapement-wheels 27 and 28 with relation to each other that corresponds substantially to a letter-space movement of the carriage. The two wheels are normally maintained in a fixed relation by an expansion-spring 61, which bears at one end against a pin 62, that projects from a face of the feed-wheel 28 and extends into the segmental slot 63, in which the spring 61 is contained. The opposite end of the spring 61 bears at 64 against an end wall of the slot 63 in the escapement-wheel 27, and a segmental guiding-pin 65 may be secured to the escapement-wheel 27 and extend into the opening 63 therein and through the spring 61 to guide it and to prevent its displacement from the slot. The spring 61, slot 63, and pin 62, as well as the slot 60, may be covered by a face-plate 66, Figs. 4 and 8, that is secured in place by a collar 67 and a set-screw 68, which is received in a threaded opening and passes through the collar and bears at its inner end against the shaft 30. This face-plate 66 is apertured at 66<sup>a</sup> for the passage of the pin 59, which extends beyond the outer face thereof, as illustrated in Fig. 4, and is screw-threaded at 69 for coöperation with an internally screw-threaded thumb-nut 70, and the outer end of the pin may be headed at 59<sup>x</sup> to prevent the removal of the thumb-nut. The thumb-nut 70 is adapted to bear at its inner end 71 against the face-plate and to bind the escapement-wheels 27 and 28 together to rotate as one part. When, however, the thumb-nut 70 is loosened, the escapement-wheels 27 and 28 are free to receive a limited movement one with relation to the other.



While the faces 54 of the crown-teeth 52 have been described as substantially straight or radial, it will be observed that they do not radiate from the center of the wheel, but are each slightly inclined from the crown toward the periphery of the wheel.

The purpose of inclining the face 54 of each tooth 52 is to tend in the operation of the machine to draw the feed-dog to the lowermost position in its movement from the position shown in Fig. 7 to that illustrated in Fig. 5 or to prevent too free a movement thereof in an upward direction, and thereby overcome any tendency of an automatic vibration of the feed-dog when the parts are working under light tension, with a consequent skipping of the escapement. This inclination of the face 54 of each of the teeth 52 is so slight, however, that it does not retard the upward movement of the feed-dog, which is effected by a depression of a character-key or the space-key 72.

It has been explained that the escapement-wheels are adapted to move independently of one another when the thumb-screw 70 is loosened and to rotate together as one escapement-wheel when the thumb-screw has been screwed down to bind the wheels together. When the wheels are free to move independently of one another, the escapement is set for "speed" or reverse feed. When, however, the wheels 27 and 28 are secured to rotate together, the escapement is regulated for the ordinary feed movement. The ordinary feed movement of the parts will first be described.

The thumb-nut 70 having been screwed down to secure the escapement-wheels 27 and 28 together, with the parts disposed as shown in Fig. 5, a depression of a character-key or the spacing-key is effective to raise the feed-dog carrier 16 and the feed-dog connected thereto from the position shown in full lines in Fig. 5 to a position corresponding substantially to that shown in dotted lines in the same figure and as shown in Fig. 6. If the stroke upon the key be of the ordinary character, the feed-dog will not be raised to the height represented in Figs. 5 and 6. If, however, the operator has a following stroke, the feed-dog will be moved to substantially the position shown, where it will be arrested, and if the key continues to descend after the dog has been arrested the continued depression of the key will tend merely to raise the feed-dog carrier 16 against the tension of the spring 23 and independently of the engaged end of the feed-dog, as shown in Fig. 6, this independent movement of the feed-dog carrier and feed-dog being permitted by the pin-and-slot connection 21 22. The effect therefore is to provide a cushioning at the end of a stroke, which is highly desirable and relieves the fingers of the operator from objectionable shock that would ordinarily result from suddenly arresting the feed-dog during the depression of a key.

It will be understood that the spring 23 is only brought into play in the manner described when a long following stroke is given to the key, and in the normal operation of the machine the feed-dog and its carrier move together as one part. After a depression of the key and when it starts to return to the normal position the pressure of the carriage-drum upon the escapement-wheels is effective to turn them together in the direction of the arrow in Figs. 5, 6, and 8. This movement of the wheels will tend, through the bevel-face 57 of the engaged tooth 56, to cam or depress the feed-dog, as indicated in Fig. 8, until the engaged tooth 56 clears it, and the dog will be restored to the normal position shown in full lines in Fig. 5, where it is in a position to arrest the next succeeding and advancing tooth 52 on the escapement-wheel 28, thus permitting the carriage to be fed one letter-space distance. It should be understood that the movement of the feed-dog from the position shown in Fig. 6 back to the normal position is controlled in the main by the spring 11 of the rocker-shaft, but that nevertheless the beveling 57 upon each of the teeth 56 facilitates the return movement of the dog by camming it down into the path of the next advancing tooth on the wheel 28, thereby providing a quick and efficient escapement wherein there is no liability of the carriage skipping. It will likewise be seen that in the normal operation of the machine the feed-dog and its carrier constitute practically one part and that no spring is relied upon to restore the feed-dog to its normal position other than the spring 11, which is employed to restore the rock-shaft 10 and the associated parts to the normal position. In other words, no spring is employed in the normal operation of the machine between the rock-shaft and the feed-dog, these parts under normal conditions being positively operated.

In order to provide a reverse feed of the mechanism, it is merely necessary to loosen the thumb-nut 70, and a depression of a key at this time will cause the feed-dog to be moved from the position shown in full lines in Fig. 5 to the position shown in Fig. 7, and the tension of the carriage-drum will overcome the tension of the spring 61, thereby causing the escapement-wheel 28 to be rotated in the direction of the arrow substantially a letter-space distance, when the pin 59 will arrive at one end of the slot 60, as indicated in Fig. 7, thus preventing further independent rotation of the escapement-wheel 28 with relation to the wheel 27. The carriage will therefore be released on the downstroke of the finger-key, and when pressure is released from the finger-key the feed-dog will be restored to the full-line position shown in Fig. 5 without permitting a further advance movement of the escapement-wheel 28. This movement of the feed-dog from the position shown in Fig. 7 to that indicated in full lines



in Fig. 5 is effective to release the wheel 27, when it will be advanced a letter-space distance by its spring 61, and the parts are then in position for the next operation. It will be  
 5 observed that the beveling 57 on each tooth 56 of the escapement-wheel 27 permits a quick advance movement of the escapement-wheel. In other words, the escapement-wheel 27 starts to rotate by the pressure of its spring 61 as  
 10 soon as the feed-dog starts to move from the position shown in Fig. 7 to the full-line or normal position shown in Fig. 5, and by the time the feed-dog releases the tooth 56 the escapement-wheel 27 will have all but com-  
 15 pleted its movement to the normal position.

The construction and operation of the escapement are such that no nice judgment is necessary to change the device from ordinary to a reverse feed or vice versa, because of the  
 20 fact that it is merely necessary to screw down the binding-screw or to loosen it, as the case may be, when the parts are at rest or in the normal position, and in accordance with the turning of this screw the machine is regulated  
 25 to feed ordinary or reverse at will.

From the foregoing description it will be understood that the construction is such in the ordinary feed that the carriage will com-  
 30 mence its movement the instant the pressure of the operator's finger is relieved upon the key and that it is possible to reduce the weight of escapement and its controlling mechanism to a point that will allow of the attainment of a very high speed and without the employ-  
 35 ment of extremely stiff springs.

While I have shown and described two separate escapement-wheels, which may be secured to rotate together, it should be under-  
 40 stood that from certain aspects of my invention a single feed rack or wheel carrying two series of teeth may be employed and various other changes may be made without departing from the spirit of my invention.

While I have described with considerable  
 45 detail one manner in which the escapement mechanism operates when set for ordinary feed and one manner in which it operates when set for reverse feed, it should be understood that the operation may vary some-  
 50 what under different conditions. For instance, an adjustment of a turnbuckle 15, a change in the tension of the spring 23 employed between the feed-dog and its carrier, or a change in the tension of the carriage-  
 55 spring may alter somewhat the operations specifically described above, though the operations are substantially the same under different conditions.

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

1. In a type-writing machine, the combination of a carriage, a plurality of feed-wheels therefor, means cooperating with the feed-  
 65 wheels to afford a step-by-step feed of the carriage, and regulating means cooperating with said feed-wheels, whereby they may afford an "ordinary" or "reverse" feed at will.

2. In a type-writing machine, the combination of a carriage, a feed-wheel therefor, said feed-wheel having a double row of teeth  
 70 thereon, one of said rows being crown-teeth which project laterally from the wheel, and a feed-dog which cooperates with said teeth to afford a feed of the carriage.

3. In a type-writing machine, the combination of a power-driven carriage, an escape-  
 75 ment-wheel therefor, said escapement-wheel having two concentric rows of teeth thereon in the same plane, a feed-dog which cooperates with said teeth to afford a feed of the car-  
 80 riage, finger-keys, and means for moving said feed-dog at each operation of a finger-key.

4. In a type-writing machine, the combination of a carriage, two feed-wheels therefor, one of said feed-wheels having a row of later-  
 85 ally-extending crown-teeth projecting from the side thereof and one of said rows being contained within the other, and a feed-dog which cooperates with both of said feed-  
 90 wheels to afford a step-by-step feed of the carriage.

5. In a type-writing machine, the combination of a carriage, two feed-wheels therefor, which wheels are adapted to rotate together  
 95 for one character of letter-spacing and to have a limited movement with relation to each other for another character of letter-spacing, and a feed-dog which cooperates with both of said feed-wheels to afford a step-by-step feed  
 100 of the carriage.

6. In a type-writing machine, the combination of a carriage, two feed-wheels therefor, a feed-dog which cooperates with both of said  
 105 feed-wheels to afford a step-by-step feed of the carriage, and regulating means for said feed-wheels to cause them to feed "ordinary" or "reverse" as desired.

7. In a type-writing machine, the combination of a carriage, two feed-wheels therefor, which wheels are adapted to rotate together  
 110 and to have a limited movement with relation to each other, a feed-dog which cooperates with both of said feed-wheels to afford a step-by-step feed of the carriage, and means for securing said wheels to rotate together,  
 115 whereby an "ordinary" or "reverse" feed of the carriage may be provided at will.

8. In a type-writing machine, the combination of a carriage, two feed-wheels therefor, a spring which exerts a force to maintain a fixed  
 120 relation between said feed-wheels, a feed-dog which cooperates with said feed-wheels, and means for determining whether the said feed-wheels will rotate together or will receive limited movements relatively one to the other  
 125 for each letter-feed movement of the carriage.

9. In a type-writing machine, the combination of a carriage, two feed-wheels therefor, the teeth of said wheels being concentric and  
 130 in the same plane, a feed-dog cooperating with the teeth of both wheels, and spring-pressed means which tend to maintain a fixed relation between said feed-wheels.

10. In a type-writing machine, the combina-



tion of a carriage, a feed-wheel therefor that is adapted to receive intermittent movements each corresponding substantially to a letter-space movement of the carriage, a second feed-wheel carried by said first-named wheel and having a movement independently thereof that corresponds substantially to a letter-space movement of the carriage, and a feed-dog which coöperates with both of said feed-wheels, whereby a reverse feed may be afforded.

11. In a type-writing machine, the combination of a carriage, a feed-wheel therefor, a second feed-wheel carried by said first-named wheel and having a movement independently thereof that corresponds substantially to a letter-space movement of the carriage, a feed-dog which coöperates with both of said feed-wheels, and means for securing said wheels to rotate together, whereby either "ordinary" or "reverse" feed of the carriage may be provided at will.

12. In a type-writing machine, the combination of a carriage, a feed-wheel therefor, a second feed-wheel carried by said first-named wheel and having a movement independently thereof that corresponds substantially to a letter-space movement of the carriage, a spring which tends to maintain a fixed relation between said feed-wheels, a feed-dog which coöperates with both of said feed-wheels, and means for securing said wheels to rotate together, whereby either "ordinary" or "reverse" feed of the carriage may be provided at will.

13. In a type-writing machine, the combination of a carriage, a feed-wheel having beveled teeth thereon, a second feed-wheel carried by said first-named wheel and having a movement independently thereof that corresponds substantially to a letter-space movement of the carriage, the teeth of the second wheel having beveled faces which are disposed opposite to the beveled faces on the first-mentioned feed-wheel, a spring which tends to maintain a fixed relation between said feed-wheels, a feed-dog which coöperates with both of said feed-wheels, and means for securing said wheels to rotate together, whereby either an "ordinary" or "reverse" feed of the carriage may be provided at will.

14. In a type-writing machine, the combination of a carriage, a carriage feed-wheel having two rows of oppositely-disposed beveled teeth and a beveled feed-dog coöperating therewith.

15. In a type-writing machine, the combination of a carriage, two feed-wheels therefor having oppositely-disposed beveled teeth, one of said feed-wheels having a limited movement independently of the other, and a beveled feed-dog coöperating with the teeth on both of said wheels.

16. In a type-writing machine, the combination of a carriage, two feed-wheels therefor having oppositely-disposed beveled teeth, one of said feed-wheels having a limited move-

ment independently of the other, a spring which tends to maintain a fixed relation between said feed-wheels, and a beveled feed-dog coöperating with the teeth on both of said wheels.

17. In a type-writing machine, the combination of a carriage, two feed-wheels therefor having oppositely-disposed beveled teeth, one of said feed-wheels having a limited movement independently of the other, a beveled feed-dog coöperating with the teeth on both of said wheels, and means for securing said wheels against movement one with relation to the other.

18. In a type-writing machine, the combination of a carriage, a carriage feed-wheel having crown-teeth thereon, a second feed-wheel having peripheral teeth thereon, said second-named wheel being contained within the line of crown-teeth on the other wheel, and a feed-dog coöperating with teeth of both wheels.

19. In a type-writing machine, the combination of a carriage, a carriage feed-wheel having crown-teeth thereon, a second feed-wheel having peripheral teeth thereon, said second-named wheel being contained within the line of crown-teeth on the other wheel, a feed-dog coöperating with teeth of both wheels, and means which permit a limited movement of said wheels one with relation to the other.

20. In a type-writing machine, the combination of a carriage, a carriage feed-wheel having crown-teeth thereon, a second feed-wheel having peripheral teeth thereon, said second-named wheel being contained within the line of crown-teeth on the other wheel, a feed-dog coöperating with teeth of both wheels, means which permit a limited movement of said wheels one with relation to the other, and means for securing said wheels to rotate together as one wheel.

21. In a type-writing machine, the combination of a carriage, a carriage feed-wheel having crown-teeth thereon, a second feed-wheel having peripheral teeth thereon, said second-named wheel being contained within the line of crown-teeth on the first-mentioned wheel, a feed-dog coöperating with teeth of both wheels, means which permit a limited movement of said wheels one with relation to the other, a spring which tends to maintain a fixed relation between said feed-wheels, and means for securing said wheels to rotate together as one wheel, whereby an "ordinary" or "reverse" feed of the carriage may be provided.

22. In a type-writing machine, the combination of a carriage, a feed-rack carried thereby, a feed-pinion which meshes therewith, a feed-wheel operatively connected to said feed-pinion, a second feed-wheel which is connected to said first-mentioned feed-wheel by a pin-and-slot connection, a spring which exerts a pressure between said feed-wheels and tends to maintain them at their limit of movement in one direction with relation to each other, a feed-dog which coöperates with the teeth on



both of said feed-wheels, and means for determining whether the wheels will rotate together or separately to afford the letter-spacing of the carriage.

5 23. In a type-writing machine, the combination of a carriage, a feed-rack carried thereby, a feed-pinion which meshes therewith, a feed-wheel operatively connected to said feed-pinion, a second feed-wheel which is connected  
10 to said first-mentioned feed-wheel by a pin-and-slot connection, a spring which exerts a pressure between said feed-wheels and tends to maintain them at their limit of movement in one direction with relation to each other,  
15 means for locking said feed-wheels to rotate together, and a feed-dog which coöperates with the teeth on both of said feed-wheels.

24. In a type-writing machine, the combination of a carriage, a carriage feed-wheel having crown-teeth thereon, a second feed-wheel  
20 located within the line of crown-teeth of the other feed-wheel, a pin-and-slot connection between said wheels which permits an independent movement of one wheel with relation  
25 to the other that corresponds substantially to a letter-space movement of the carriage, an opening in the second-mentioned wheel, a spring seated within said opening and bearing at one end against an end wall thereof, a  
30 pin which is secured to the first-mentioned wheel and projects into said opening and forms a bearing for the opposite end of said spring, and a feed-dog which coöperates with the teeth of both of said feed-wheels.

35 25. In a type-writing machine, the combination of a carriage, a carriage feed-wheel having crown-teeth thereon, a second feed-wheel located within the line of crown-teeth of the other feed-wheel, a pin-and-slot connection  
40 between said wheels which permits an independent movement of one wheel with relation to the other that corresponds substantially to a letter-space movement of the carriage, an opening in the second-mentioned wheel, a  
45 spring seated within said opening and bearing at one end against an end wall thereof, a pin which is secured to the first-mentioned wheel and projects into said opening and forms a bearing for the opposite end of said  
50 spring, a feed-dog which coöperates with the teeth of both of said feed-wheels, and a thumb-screw which is threaded to the pin of said pin-and-slot connection and is adapted to bind the two feed-wheels to rotate together.

55 26. In a type-writing machine, the combination of a carriage, a carriage feed-wheel having inwardly-extending beveled crown-teeth thereon, a second feed-wheel located within the line of crown-teeth of the other feed-wheel,  
60 and having outwardly-extending peripheral beveled teeth thereon, a pin-and-slot connection between said wheels which permits an independent movement of one wheel with relation to the other that corresponds substantially to a letter-space movement of the carriage, an opening in the second-mentioned

wheel, a spring seated within said opening and bearing at one end against an end wall thereof, a pin which is secured to the first-mentioned wheel and projects into said opening and forms a bearing for the opposite end  
70 of said spring, a beveled feed-dog which coöperates with the beveled faces of the teeth of both of said feed-wheels, and a thumb-screw which is threaded to the pin of said  
75 pin-and-slot connection and is adapted to bind the two feed-wheels to rotate together, whereby the carriage may be fed "ordinary" or "reverse" at will.

27. In a type-writing machine, the combination of a carriage, a feed rack or wheel therefor having a double row of teeth, a single feed-dog coöperating with said wheel, a feed-dog carrier, and a spring which in the normal operation of the machine maintains a fixed relation  
80 between the feed-dog and its carrier.

28. In a type-writing machine, the combination of a carriage, a feed rack or wheel having a double row of teeth therefor, a single feed-dog coöperating with said wheel, a feed-dog carrier, and a spring which in the normal operation of the machine maintains a fixed relation between the feed-dog and its carrier, but which permits a further movement of the dog-carrier after the dog has  
90 been forced into contact with the feed-wheel.

29. In a type-writing machine, the combination of a carriage, a type-carrier, key-levers therefor, a carriage feed rack or wheel having a double row of teeth, a single feed-dog coöperating with said wheel, a feed-dog carrier, and a spring which in the normal operation of the machine maintains a fixed relation between the feed-dog and its carrier but which permits a further movement of  
100 the dog-carrier after the dog has been forced into contact with the feed-wheel and by a full depression of the finger-key.

30. In a type-writing machine, the combination of a carriage, a feed rack or wheel therefor having a double row of teeth, a single feed-dog coöperating with said wheel, a feed-dog carrier to which said dog is pivoted and with relation to which the carrier may be moved for a limited distance in the direction of movement of said dog, and a spring which normally maintains a fixed relation  
110 between the dog and its carrier.

31. In a type-writing machine, the combination of a carriage, a feed rack or wheel, a feed-dog that coöperates therewith and the movement of the engaging member of which is in the plane of the teeth of said feed rack or wheel, a feed-dog carrier, and a spring that normally maintains a fixed relation between  
120 the dog and its carrier.

32. In a type-writing machine, the combination of a carriage, a feed-wheel having oppositely-disposed beveled teeth, a beveled feed-dog, the movement of the engaging member  
130 of which is in the plane of the teeth of the feed-wheel, a feed-dog carrier to which the feed-



dog is pivoted, and a spring that normally maintains a fixed relation between the feed-dog and its carrier.

5 33. In a type-writing machine, the combination of a carriage, a feed-wheel having a double row of oppositely-disposed beveled teeth, a single beveled feed-dog, the movement of which is toward and away from the axis of the feed-wheel, a feed-dog carrier to which  
10 the feed-dog is pivoted and with relation to which the carrier may be moved for a limited distance in the general direction of movement of said feed-dog, and a spring that normally maintains a fixed relation between the  
15 feed-dog and its carrier.

34. In a type-writing machine, the combination of a carriage, printing instrumentalities, finger-keys therefor, two feed-wheels that are adapted to move relatively to each  
20 other, and a feed-dog that is normally in engagement with one of said wheels and is adapted to afford a full letter-space move-

ment of the carriage on the downward movement of a finger-key and when the dog is moved from its initial position of engage- 25  
ment with one wheel and into engagement with the other.

35. In a type-writing machine, the combination of a carriage, printing instrumentalities, finger-keys therefor, a feed-wheel comprising a loose member and a fast member 30  
that are adapted to move relatively to each other, and a feed-dog that normally engages the fast member and affords a complete letter-feed movement of the carriage on the de- 35  
pression of a finger-key.

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 July, A. D. 1902.

CHARLES H. SHEPARD.

Witnesses:

E. M. WELLS,  
CHARLES E. SMITH.