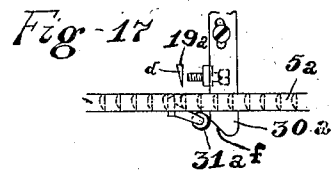
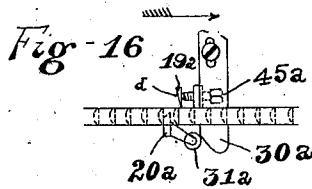
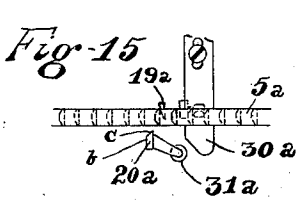
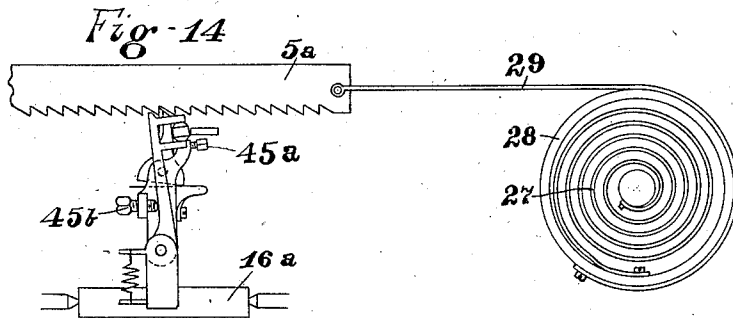
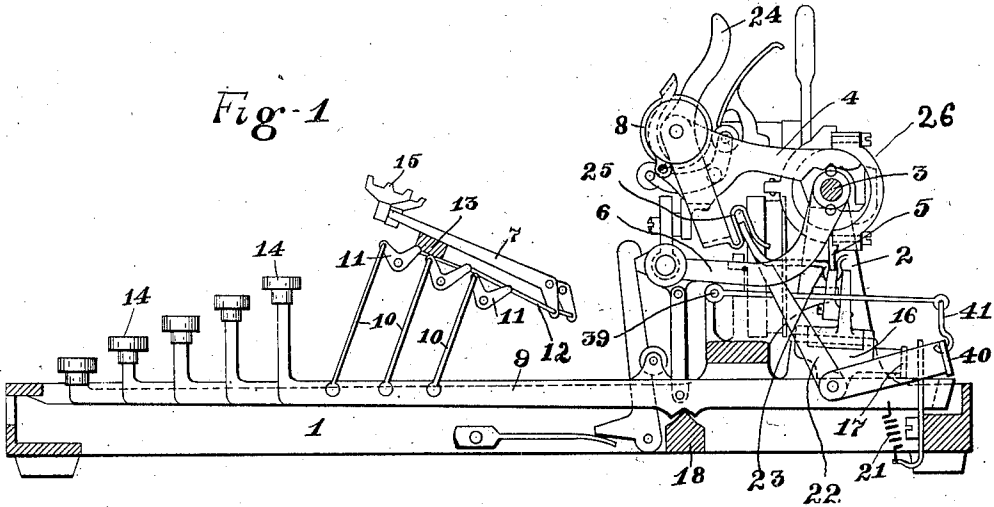


F. W. HILLARD.
TYPE WRITING MACHINE.
APPLICATION FILED NOV. 10, 1902.

1,011,786.

Patented Dec. 12, 1911.

2 SHEETS—SHEET 1.



WITNESSES:

Edward L. Hillard
George N. Chadwick.

INVENTOR

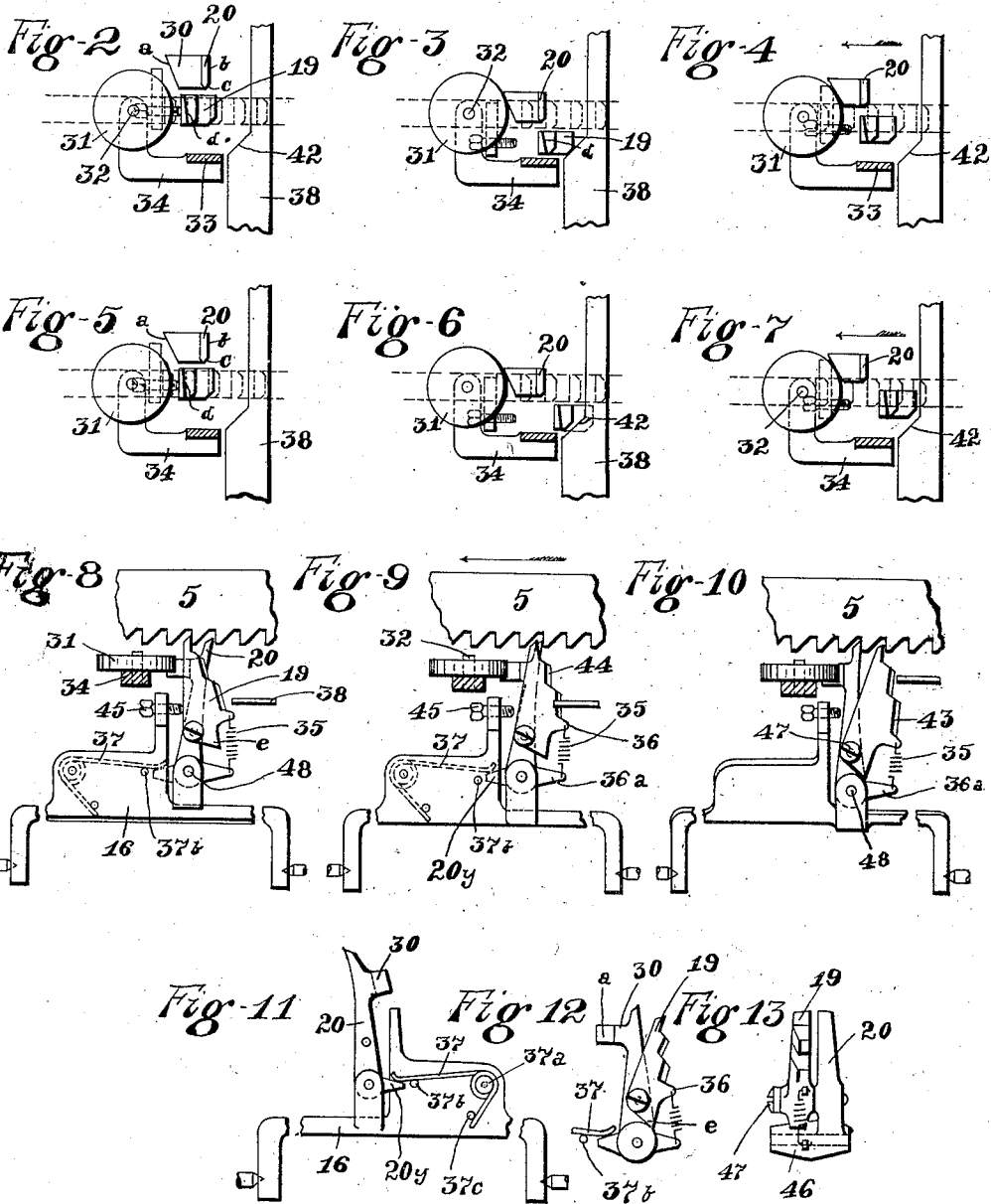
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2 SHEETS—SHEET 2.



WITNESSES:

Edward G. Thompson.
George A. Chadwick.

INVENTOR

Frederic W. Hillard

UNITED STATES PATENT OFFICE.

FREDERIC W. HILLARD, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

1,011,786.

Specification of Letters Patent.

Patented Dec. 12, 1911.

Original application filed August 25, 1896, Serial No. 603,845. Divided and this application filed November 10, 1902. Serial No. 130,756.

To all whom it may concern:

Be it known that I, FREDERIC W. HILLARD, a resident of Tottenville, in the county of Richmond and city 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 application is a division of my application filed in the United States Patent Office on the 25th day of August, 1896, which has been serially numbered 603,845.

The invention described in this application relates to an improved escapement for the spaced member of typewriting machines, and has for its object to provide such a construction thereof as will result in a quick and steady feed of the spaced member, as well as to permit the key levers to be worked with a light finger pressure.

The escapement herein described has many advantages in common with the escapements described in my prior patents, viz: No. 554,874, dated February 18th, 1896; No. 577,982, dated March 2nd, 1897; and No. 616,840, dated December 27th, 1898, to which patents reference is hereby made for the disclosure of the general principles involved in the action of the present escapement.

I will, in the accompanying specification and claims, point out and claim the several features particular to this invention and which I desire to protect by Letters Patent of the United States.

Referring to the accompanying drawings, in which corresponding parts are designated by similar marks of reference: Figure 1 is a detail side elevation of a typewriting machine equipped with my improved escapement, some parts of the machine being cut away in longitudinal section to more clearly show the escapement mechanism. Figs. 2 to 13 inclusive are detail and positional views of the escapement. Figs. 2, 3 and 4 are positional views in single spacing, the rack being shown in dotted lines. Figs. 5, 6 and 7 show the positions of the parts in double spacing, with the rack shown in dotted lines. Figs. 8, 9 and 10 are front elevations of the parts in the positions which

they assume, 1st in their normal state, 2nd in their position for single spacing, and 3rd in their position for double spacing. Fig. 11 is a detail of the rear dog, and of the spring for the rear dog, as seen from the rear of the detent. Figs. 12 and 13 are respectively front and side views of the front and rear dogs detached from the escapement rocker, showing the method of pivoting the front dog to the rear dog and the rear dog to the rocker. Fig. 14 is a detail view of the carriage main spring, main spring barrel and a modification of the escapement. Figs. 15, 16 and 17 are positional views of the escapement of Fig. 14; Fig. 15 showing normal position, Fig. 16 that when a key is partially depressed and Fig. 17 that corresponding to the full depression of a key.

Fig. 1 shows a sectional view of the base frame 1. Extending in a perpendicular direction from the back portion of the base frame are the brackets 2 (only one of which is shown) for the carriage guide rail 3 and the parts mounted on the guide rail. The principal parts which are mounted on the guide rail are the carriage 4, the rack 5 journaled on the rail 3 by the collars 26, and the carriage shifting frame 6. At the front of the machine is placed the key board. The type bars 7 are pivoted on a suitable plate (not shown) in front of the platen 8, and are operatively connected with the key levers 9 by means of the key lever connecting wires 10, bell crank levers 11 and type bar connecting wires 12. In their normal positions of rest the type bars lie in a basket or buffer 13 as is usual in typewriters, and upon depression of any key 14 the connected type bar is caused to swing rearwardly to bring its type 15 to the printing point at the platen to effect the printing.

The detent or escapement rocker 16 is pivotally mounted in the machine frame below and to the rear of the carriage, and is provided with rearwardly extending arms at either end, to which are rigidly secured the universal bar 17 which rests upon the rear ends of the key levers. The key levers are hung upon the fulcrum 18 at a point in front of the universal bar 17, so

that upon depression of a key the rear end of the key lever is raised, thus lifting the universal bar and swinging the escapement rocker frontward, meaning thereby toward the front of the machine, thus disengaging the front, normally engaging dog 19 from the rack and engaging the rear, normally disengaged dog 20 therewith. The key levers are normally held in their elevated positions by the key lever springs 21 and, since the type bars are positively connected to the key levers for positive movement therewith toward and from the platen, it follows that they will be returned from their printing position at the platen to their normal positions in the buffer by means of the key lever springs 21, or by any other means which exert force to lift the keys when they are depressed.

The carriage is normally held in check by the engagement of the rack 5 with the front dog or tooth 19. A rack guide 22 holds the rack in its normal position. The rack guide may be held in its normal position by any suitable means, as say a spring or gravity, and returned by such means to its normal position after it has been moved to disengage the rack from the dog 19. On the guide 22 is a strip 23 which is bent around so that it passes under the rack and engages it on each side. On the left hand end of the carriage is the carriage release key 24 which is pivoted to a shaft on the opposite end of which the hook 25 is fastened. The hook 25 engages the rack guide 22. By pushing the release key 24 backward the rack is swung forward, revolving the rack on its journals 26 and so disengaging the rack from dog 19. The carriage can be then moved to any desired position manually and upon the release of the key 24 the rack guide will return to its normal position, thus reengaging the rack with the dog 19.

In the operation of my present escapement, upon depression of a key 14, the dog 19 is first disengaged from the rack, and under the impulse of the carriage propelling power (which may be the main spring contained in a spring barrel of the usual construction and attached to the carriage by the usual connecting band, as say carriage main spring 27, spring barrel 28 and connecting band 29 shown in Fig. 14) the carriage starts forward, meaning thereby toward the left hand side of the machine looking from the position assumed by the operator in manipulating the keys, and continues its forward movement until the rack comes in contact with dog or tooth 20 which has been brought into line with the rack by the frontward swinging movement of the rocker 16. At this time the bevel faced wing 30 of dog 20 engages with the

roller 31, pivoted on the stationary pin 32; the dog, bevel faced wing, roller and pin, thus serving to hold the rack from advancing in the line of its feed so long as the key is held down. If the key is still further depressed after the engagement of the rack with dog 20 and after the engagement of the wing 30 with the roller 31, the rack and carriage will thereby be cammed backward, meaning thereby toward the right hand side of the machine, as is fully described in my said Patent No. 554,874; and in my present escapement such camming back, as well as the extent thereof, depends, in connection with the extent of the depression of the keys, on the relative adjustment of the bevel faced wing 30 and its roller 31, as well as on the adjustment of the adjustable stop screw 45 which determines the rack holding position of the normally engaged dog 19 on the rocker 16, but instantly, upon the release of the depressed key, as soon as the disengaging movement between the rack and dog begins, the carriage 4 and rack 5 start to advance along their lines of feed, this being due to the disengagement of the feeding bevel a of wing 30 from the roller. The rack and carriage continue to feed during all of the time that the bevel faced wing is being disengaged from the roller, and during such disengagement the roller revolves on its pivot 32, the roller thus serving to reduce friction in the action of the escapement, resulting in an easy and agreeable key action and increased regularity and smoothness in the feeding of the carriage. The dog 20 is rocked forward far enough to bring the point of engagement between the beveled face a and the roller slightly to the rear of the pivotal point of the roller. If the dog 20 should be rocked too far forward the main spring could not disengage the dog from the rack, but so long as the wing 30 is in engagement with the roller to the rear of the pivotal point of the roller, the pull of the main spring tends to disengage the dog 20 from the rack and to reengage the dog 19 therewith, as is fully described in my Patent No. 580,281. Hence the normally engaging members in the escapement are disengaged by the stroke on the keys, and they are reengaged by the pull of the carriage propelling power, which also lifts the depressed keys and disengages the normally disengaged dog from the rack.

The type bars are connected to the key levers for positive movement therewith away from as well as toward the platen, and hence are also returned to normal position, or at any rate started back toward normal position by the pull of the carriage propelling power.

In order to insure that the dog 20 shall

not be rocked too far frontward there is a buffer 33 placed on frame 34, against which the front dog 19 is pushed when it has been rocked to the limit of its frontward movement, and which prevents any accidental rocking of the detent too far frontward.

From the above it will be seen that the escapement parts are started back toward normal position, the key started upward and the type bar started away from the platen, all by aid of the carriage propelling power, as soon as the depressed key is released. But the carriage propelling power may exert its pressure on the depressed key prior to its release, tending thereby to repulse or repel the finger of the operator as fully described in my said Patent No. 580,281; and such repulsion will be felt, or not, by the finger on the depressed key prior to the full depression of the key, depending on the relative adjustment of roller 30 and bevel faced wing 31 and on the adjustment of stop screw 45 in the rocker 16. Hence I have provided adjustments for varying the period at which the carriage propelling power repels the depressed key and the operator's finger thereon.

From the above it will be seen that, since the beveled face *a* of wing 30 is engaged with the roller to the rear of its pivotal point when a key is fully depressed, the rack and carriage will begin their feeding movement under the influence of the main spring instantly the depressed key is released, and that at this time such feed is due to the beveled feeding face *a* of wing 30 and to the roller 31.

The rack engaging face *d* of dog 19 is provided with a slight or anti-friction bevel extending across the entire width of the rack engaging face of the dog, to permit of the keys being easily depressed; but this bevel is not intended to permit any material feed of the carriage nor does it cause the main spring to exert any force for disengaging the normally engaging dog 19 from the rack.

The normally engaging dog 19 is pivoted directly to the side of the normally disengaged dog 20, and the dog 20 is pivoted to the detent or rocker 16 by its shaft 46, having coned bearings 48. When disengaged from the rack the dog 19 is spaced backward by spring 35, which is fastened at one end to finger 36 on dog 19 and at the other end to dog 20 by the finger 36^a. The rearward movement of dog 19 about its pivot on dog 20 is limited by the abutment of the stop part or finger *e* of dog 19 against the shaft 46 of dog 20. The spring 37 holds the dog 20 forward on the rocker,—the spring and roller 31 together serving to properly position the dog for entering between the rack teeth upon depression of any

of the keys. The spring 37 is coiled about stud or screw 37^a on the rocker and its upper and lower ends tend to close together but are held apart by stops or pins 37^b and 37^c on the rocker, against which the respective ends of the spring press forcibly, the lower end always remaining in contact with pin 37^c and the upper end remaining in contact with pin 37^b so long as dog 20 is in its normal or forward position on the rocker but being forced upward by the finger 20^x of the dog away from the pin when the dog is cammed backward by roller 31. Fig. 8 shows in dotted lines the relative positions of the spring 37 and pin 37^b in the normal position of the dog 20 and Fig. 9 their positions when dog 20 has been cammed backward by the roller,—Fig. 8 showing the spring engaged with the pin and Fig. 9 the spring lifted up by finger 20^x away from the pin.

One of the advantages of pivoting the normally engaging dog to the normally disengaged dog is that the danger of skipping in the print is thereby greatly reduced.

In my present escapement when a key is depressed the detent is thereby rocked bodily frontward while at the same time the force of the main spring acting on the bevel faced wing 30 and roller 31 tends to crowd the dog 20 rearwardly on the rocker. Therefore in case dog 19 were pivoted directly to the rocker, as is customary, instead of to dog 20 as I have shown it, the distance between the adjacent edges of the two dogs would be greater when dog 20 engages the rack than it would be when dog 19 engages the rack, and consequently the adjacent edges of the dogs would have to be placed so close together that the escapement would be unduly slow or else the rack would be in danger of skipping through between the two dogs when a key should be depressed, causing skips in the print. During a later period, after the release of the depressed key, and while the detent is being swung rearwardly the danger of skipping in the print would, under the same circumstances, be increased. But by pivoting dog 19 directly to dog 20 these dangers and objections are avoided, as in this case both dogs are crowded rearwardly on the rocker together by the main spring, and the distance between their adjacent edges remains the same when dog 20 engages the rack as it is when dog 19 is engaged.

I have provided means in my escapement for double spacing as well as for single spacing, and these will now be described.

There is no stop back of the dog 19 to limit its spacing when in line with the rack, save the shaft of dog 20, above described. But a stop 38 is provided to engage the dog 19 when that dog is rocked frontward out

of line of the rack by depression of a single spacing key 14. The stop 38 is pivoted at its front end by the pin 39 to the frame of the machine, and at its rear end is hooked to the double spacing bail 40, by the link 41. The part of this stop piece in line with dog 19 when that dog is engaged with the rack 5 is cut away so as not to interfere with the backward spacing of the dog to trip it out of the rack when returning the carriage to the starting point for a new line of print. In front of the rack, however, there is a beveled face 42 on the stop 38 which is in position to arrest the backward spacing of the dog 19, when the dog is swung out of the rack by depression of any single space key-14. On the dog 19 there is a shoulder or face 43 for engagement with the bevel face 42 in single spacing, said face 43 being beveled to match the bevel of the face 42. The shoulder 43 is in position for engagement with the stop when the stop is in its normal or lower position. The face 43 permits of the dog spacing backward one tooth space on the rack, after which it is arrested, in single spacing, by the stop 38, in position for the dog to reengage with the rack in the next tooth back of the one from which it was disengaged. When a double spacing key 14 is depressed the stop 38 is lifted by the lifting of the double spacing bail, so that the stop is in line with and at the level of the cut away part 44 above the shoulder 43 on the dog 19 when the dog is rocked forward out of the rack. The dog can then space backward far enough to reengage with the rack two teeth back, where it is stopped by the abutment of the face *e* against the shaft of the dog 20 in position for double spacing. Part of the keys are arranged to lift double spacing bail 40 and hence are double spacing keys, their key levers extending to the rear underneath the bail 40; and the remainder of the keys are adapted to rock the detent 16 and swing the type bars to the platen without lifting the bail 40, since their key levers are so short as not to extend beneath bail 40, and hence are single spacing keys. All of the key levers, both single spacing and double spacing, extend underneath the universal bar or single spacing bail 17 and operate it.

The stop 38 is provided with the beveled face 42 on the side next the dog 19 in order, for one reason, to prevent any liability of the dog butting on the edge of the stop. The bevel face 42 also acts, in single spacing, to cam the dog 19 forward on the rocker when the frontward swinging of the rocker is continued by a further depression of a key after dog 19 has been swung out of the rack and after the dog has been

spaced backward by its spring 35 into contact with the face 42. If this dog is thus cammed forward it is obvious that the resistance of the spring 35 must be overcome by pressure applied on the depressed key, and the spring thus extended to permit of the dog swinging forward on the rocker, the pressure on the key thus serving to store up energy in the spring, which stored energy may be utilized, upon the release of the key, to aid in lifting the key and restoring its connected type bar to normal position in the buffer 13 and in rocking the detent 16 rearwardly, thereby disengaging dog 20 from the rack and reengaging dog 19 therewith, by means now to be described.

After the release of the depressed key 80 the spring 35, pressing the dog 19 forcibly against the beveled face 42, tends to rock the detent rearwardly, as the dog slides down the beveled face 42, thus tending to lift the depressed key and to disengage dog 20 from the rack and reengage dog 19 therewith. Hence it is apparent that, as soon as pressure on the key lever is released by the release of the depressed key, bevel face 42, acted on by force of the spacing spring 35, cooperates with beveled face *a*, acted on by the carriage main spring, in returning the detent to normal position and thereby reengaging the normally engaging dog 19 with the rack and disengaging the normally disengaged dog therefrom, as well as in lifting the depressed key and starting the type bar back to its normal position. During the return movement, upon the reengagement of dog 19 with the rack, the dog is drawn forward with the rack by the carriage main spring to its forward limit on the rocker 16, where it is stopped by its contact with the adjustable stop screw 45, the main spring thus serving to impart tension or force to be stored up in spring 35; which force is transmitted, upon depression of a key, through dog 19, and beveled face 42 for restoring said parts to their normal positions after they have been operated. In my herein described escapement I depend wholly on the means above enumerated for restoring the detent 16 and its parts to normal position, and have dispensed with the usual escapement returning spring, but wish to have it understood that such a returning spring may be also employed if desired.

The two dogs 19 and 20 are so placed on the detent 16 that in single spacing the carriage is fed part of the tooth space by the dog 20 and the remainder of the tooth space by the dog 19; and in double spacing the carriage is fed part of one tooth space by the dog 20 and one and a part tooth spaces by the dog 19. The two dogs are staggered with respect to each other on the rocker. By

means of the adjustable stop screw 45 the portion of the feed to be performed under control of either dog may be varied.

In single spacing I have provided the shoulder 43 which engages stationary stop 38 to limit the rearward spacing of dog 19 for letter spacing, and for double spacing I have provided the finger *e* on the dog which engages the shaft 46 of dog 20, constituting a movable stop; but I wish it understood that I may use either the stationary stop 38 or the movable stop 46 at will in single spacing, as for example with the modified escapement of Figs. 14 to 17, designed for single spacing only.

A difficulty which I have overcome by the use of finger *e* and its abutment 46, is the liability of the dog 19 to enter the rack a tooth to the rear of the one which it should enter on reengaging the rack upon the release of a depressed key, resulting in skipping, viz., a double space feed of the carriage where there should be single spacing, or a treble feed where there should be double. This difficulty is due to the fact that the rack does not remain stationary while the dog 19 is disengaged, but on the contrary feeds forward while the bevel faced wing 30 runs down the roller 31, prior to the reentry of dog 19 into the rack tooth. The manipulation of the keys is exceedingly rapid in printing, so that often a depressed key is released and the feed of the rack begins and has progressed so far before the dog 19 reenters the rack that in case the backward spacing of the dog is determined by a stationary stop, as is usual, the dog will reenter the rack a tooth one tooth too far back of the one from which it had escaped; and this is particularly true in double spacing, since it takes longer for dog 19 to space backward two rack teeth than one. I therefore arrange the stop 46 to space forward and back with the normally disengaged dog, thereby insuring that the normally engaged dog, when disengaged, shall space to a uniform distance backward in the line of feed, relatively to the normally disengaged dog, in all the positions in that line that the normally disengaged dog occupies while engaged with the rack.

In the operation of the escapement, during the depression of a double spacing key, as soon as dog 19 has been disengaged from the rack, it spaces backward on its pivot 47 on dog 20 until finger *e* abuts on shaft 46, limiting the backward movement of the dog 19 upon dog 20, and proper positioning the dog to reenter the second rack tooth back of the one from which it had been disengaged. Upon the further depression of the key, after wing 30 has engaged roller 31, dog 20 will be cammed backward, together with the rack 5 in case a legato blow is struck (as is

fully described in my said Patent No. 554,874), by roller 31 and beveled wing 30, thus permitting dog 19 to swing still farther backward, in unison with the rack and in line with the tooth it is to reenter after the release of the key; so that the dog 19 will still be properly positioned to reenter the second tooth on the rack back of the one that it formerly engaged. But whether the key be only partially depressed for printing, as with the staccato blow, or fully depressed, as with the legato blow (as is fully described in my said Patent No. 554,874), upon release of the key the rack will be advanced, under the influence of the carriage main spring, with dog 20, thus drawing dog 19 forward and maintaining it in the same relation with the rack until it reengages therewith. It will thus be seen that, upon the release of a depressed key, the carriage propelling power spaces the normally engaging dog 19 forward in unison with the rack while said dog is disengaged and prior to its reengagement with the rack, as well as serves to reengage said dog with the rack. In moving the carriage and rack backward manually to bring them to the starting point for a new line of print, the dog 19 trips backward and down out of the rack; first swinging backward and down on its pivot 47 on dog 20 until finger *e* abuts on the shaft 46, and thereafter, by means of its pivotal connection 47 and the abutment 46 and finger *e*, forcing dog 20 backward and down on its pivot 48 on the detent, until dog 19 has been swung down sufficiently to clear the rack.

In Figs. 14 to 17, Fig. 14 shows a detail of the carriage main spring 27, wound up in the spring barrel 28, the barrel being broken away on one side for the purpose of showing the spring. The dog 20^a is provided with a roller 31^a, mounted on the dog, which engages with a fixed bevel faced plate 30^a. The plate 30^a is adjustable on the frame of the machine. The dogs 19^a and 20^a are staggered with respect to each other in the adjustment shown, so that part of the tooth space is fed with one dog and part with the other dog. The backward movement of dog 20^a on the detent 16^a is adjustably limited by the adjustable stop screw 45^b, and the forward movement of dog 19^a on the detent is adjustably limited by adjustable stop screw 45^a, which may be so adjusted on the detent as to permit the desired portion of the feed to be performed under control of each dog. The stop screw 45^b should be so adjusted as to correspond to the various adjustments of cam plate 30^a.

In the construction of Figs. 14 to 17, the roller 31^a and bevel faced plate 30^a perform functions similar to the bevel faced wing 30 and roller 31 of Figs. 1 to 13, but in the two constructions the positions of these

parts are reversed, serving to illustrate the fact that broadly it is immaterial whether the roller be mounted on a fixed part of the machine and the bevel faced part co-acting therewith on the dog, or vice versa. The normally engaged dog in Figs. 14 to 17 is provided with a beveled face *c*, and an unbeveled face *b*, as is fully described in another application filed by me on the 15th day of August, 1899, Serial No. 727,275, as a division of my said original application Serial No. 603,845.

While I have shown my invention as applied to a straight rack escapement it is obvious that a circular rack, in the form of the well known escape wheel may be used; that the relative location of the parts may be varied, and the rack mounted on the machine frame and the escapement rocker on the carriage; and that the carriage may be either in the form of a paper carriage or a type carriage. I mention these various structures not as indicating modifications of my invention, but to illustrate the scope of my claims. I use the term "spaced member" and "spacing member" as defining generally the two parts of the escapement, and the term "rack" as generic to straight and circular racks.

Having thus described my invention what I claim and desire to secure by patent is:

1. In a typewriter escapement, the combination, with a rack, of a spacing rocker and two dogs movable in the line of spacing one of which is directly mounted on the spacing rocker and the other indirectly.

2. In a typewriter escapement, the combination, with a rack, of a spacing rocker and two dogs movable in the line of spacing one of which is mounted on the other and the other on the spacing rocker.

3. In a typewriter escapement, the combination of two engaging members, a spacing rocker in one member and two dogs thereon movable in the line of spacing which alternately engage the other member, one of which dogs is directly mounted on the spacing rocker and the other indirectly.

4. In a typewriter escapement, the combination of two engaging members, a spacing rocker in one member and two dogs thereon movable in the line of spacing, one of which is normally disengaged but adapted to engage the other member and is directly mounted on the spacing rocker, and the other of which normally engages the said other member and is mounted on said normally disengaged dog.

5. In a typewriter escapement, the combination, with a rack, of a spacing rocker, a normally disengaged dog movably mounted thereon in the line of spacing and a normally engaging dog movably mounted on said normally disengaged dog.

6. In a typewriter escapement, the combination, with a rack, of a spacing rocker, a normally disengaged dog movably mounted thereon in the line of spacing, a normally engaging dog movably mounted on said normally disengaged dog and means for spacing the normally engaging dog backward on the normally disengaged dog.

7. In a typewriter escapement, the combination, with a rack, of a spacing rocker, a normally disengaged dog movably mounted thereon in the line of spacing, a normally engaging dog movably mounted on said normally disengaged dog, a spring for spacing the normally engaging dog backward on the normally disengaged dog and an abutment or stop to limit said backward spacing.

8. In a typewriter escapement, the combination, with a rack, of a detent, a normally disengaged dog movably mounted thereon, a normally engaging dog movably mounted on said normally disengaged dog, a spring for spacing the normally engaging dog backward on the normally disengaged dog, an abutment or stop upon the normally disengaged dog to limit said backward spacing, said stop being arranged and adapted for movement forward and backward in unison with the normally disengaged dog, whereby the backward spaced position of the normally engaging dog is maintained in a uniform relation to said normally disengaged dog in all positions of the normally disengaged dog while the normally engaging dog is disengaged from the rack.

9. In a typewriter escapement, the combination, with a rack, of a detent, two movable dogs mounted thereon one of which normally engages the rack and the other of which is normally disengaged, means for disengaging said normally engaging dog, means for spacing it backward relatively to the normally disengaged dog and means for spacing it backward with said normally disengaged dog.

10. In a typewriter escapement, the combination, with a rack, of a detent, two movable dogs mounted thereon one of which normally engages the rack and the other of which is normally disengaged, means for disengaging said normally engaging dog, a spring for spacing it backward relatively to said normally disengaged dog and means operated by a key for spacing both dogs backward together.

11. In a typewriter escapement, the combination, with a rack, of a detent, two movable dogs mounted thereon one of which normally engages the rack and the other of which is normally disengaged, means for disengaging said normally engaging dog, a spring for spacing it backward relatively to said normally disengaged dog and a cam for spacing both dogs backward together.

12. In a typewriter escapement, the combination, with a rack, of a detent, two movable dogs mounted thereon one of which normally engages the rack and the other of which is normally disengaged, means for disengaging said normally engaging dog, a spring for spacing it backward relatively to said normally disengaged dog and a roller and a part co-acting therewith for spacing both dogs backward together.

13. In a typewriter escapement, the combination, with a rack, of a detent and two movable dogs thereon, one of which normally engages the rack and the other of which is normally disengaged, a spring for spacing the normally engaging dog backward on the detent when disengaged, an abutment or stop upon the normally disengaged dog to limit said backward spacing, said stop being arranged and adapted for movement forward and backward in unison with the normally disengaged dog, whereby the backward spaced position of the normally engaging dog is maintained in a uniform relation to said normally disengaged dog as long as the normally engaging dog is disengaged from the rack, and means operated by the carriage propelling power for disengaging the normally disengaged dog from the rack.

14. In a typewriter escapement, the combination, with a rack, of a detent and two movable dogs thereon, one of which normally engages the rack and the other of which is normally disengaged, a spring for spacing the normally engaging dog backward on the detent when disengaged, an abutment or stop upon the normally disengaged dog to limit said backward spacing, said stop being arranged and adapted for movement forward and backward in unison with the normally disengaged dog, whereby the backward spaced position of the normally engaging dog is maintained in a uniform relation to said normally disengaged dog as long as the normally engaging dog is disengaged from the rack, and a beveled face on the normally disengaged dog to permit forward feed of the rack prior to the reengagement of the normally engaging dog with the rack.

15. In a typewriter escapement, the combination of a rack and two dogs one of which normally engages the rack and the other of which is normally disengaged but adapted to engage the rack, means operated by a key for spacing both dogs backward together and means operated by the carriage propelling power for spacing both dogs forward together.

16. In a typewriter escapement, the combination of a rack and two dogs one of which normally engages the rack and the other of which is normally disengaged,

means operated by depression of a key for engaging said normally disengaged dog with the rack and means operated by the carriage propelling power for spacing both dogs forward together while the normally engaging dog is disengaged from the rack and means operated by the carriage propelling power for lifting the depressed key.

17. In a typewriting machine, the combination of a type bar, an escapement comprising a rack and two dogs one of which normally engages the rack and the other of which is normally disengaged, means operated by a key for moving the type bar to print and for engaging said normally disengaged dog with the rack, and means operated by the carriage propelling power for spacing both dogs forward together while the normally engaging dog is disengaged from the rack and means operated by the carriage propelling power for starting the type bar back to its position of rest.

18. In a typewriting machine, the combination of a type bar, an escapement comprising two movable dogs and a detent on which they are mounted and a rack, one of said dogs normally engaging the rack and the other normally disengaged, means operated by depression of a key for moving the type bar to print and for engaging said normally disengaged dog with the rack and for disengaging said normally engaging dog, and means operated by the carriage main spring for spacing both dogs forward with the rack while the normally engaging dog is disengaged and means operated by the carriage propelling power for lifting the depressed key and starting the type bar back to its position of rest.

19. In a typewriter escapement, the combination, with a rack, of a movable dog which normally engages therewith, means for disengaging the dog from the rack, means for spacing the dog when disengaged, a stop to limit said spacing movement, a member arranged and adapted to control the rack while the dog is disengaged and to permit feed of the rack under the influence of the carriage propelling power prior to the reengagement of the dog with the rack, means for varying the rack controlling position of said member and for correspondingly varying the position of said stop thereby, substantially as described.

20. In a typewriter escapement, the combination, with a rack, of a movable dog which normally engages therewith, means for disengaging the dog from the rack, means for spacing the dog backward when disengaged and a stop to limit said backward spacing movement, a bevel faced member arranged and adapted to control the rack while the dog is disengaged and to permit feed of the rack under the influence of

the carriage main spring prior to the re-engagement of the dog with the rack, and means for varying the rack controlling position of said member and for correspond-
5 ingly varying the position of said stop thereby.

21. In a typewriter escapement, the combination, with a rack, of a movable dog which normally engages therewith and a
10 normally disengaged dog, means for disengaging the normally engaging dog from the rack and for spacing it backward when disengaged, a beveled face on the normally dis-

engaged dog arranged and adapted to control the rack when the normally engaging
15 dog is disengaged, a stop on said normally disengaged dog to limit said backward spacing of the normally engaging dog, and means for varying the rack holding position of said normally disengaged dog.

Signed by me in New York city, this 7th
20 day of November, 1902.

FREDERIC W. HILLARD.

Witnesses:

GEO. N. CHADWICK,
R. G. DAVIS.