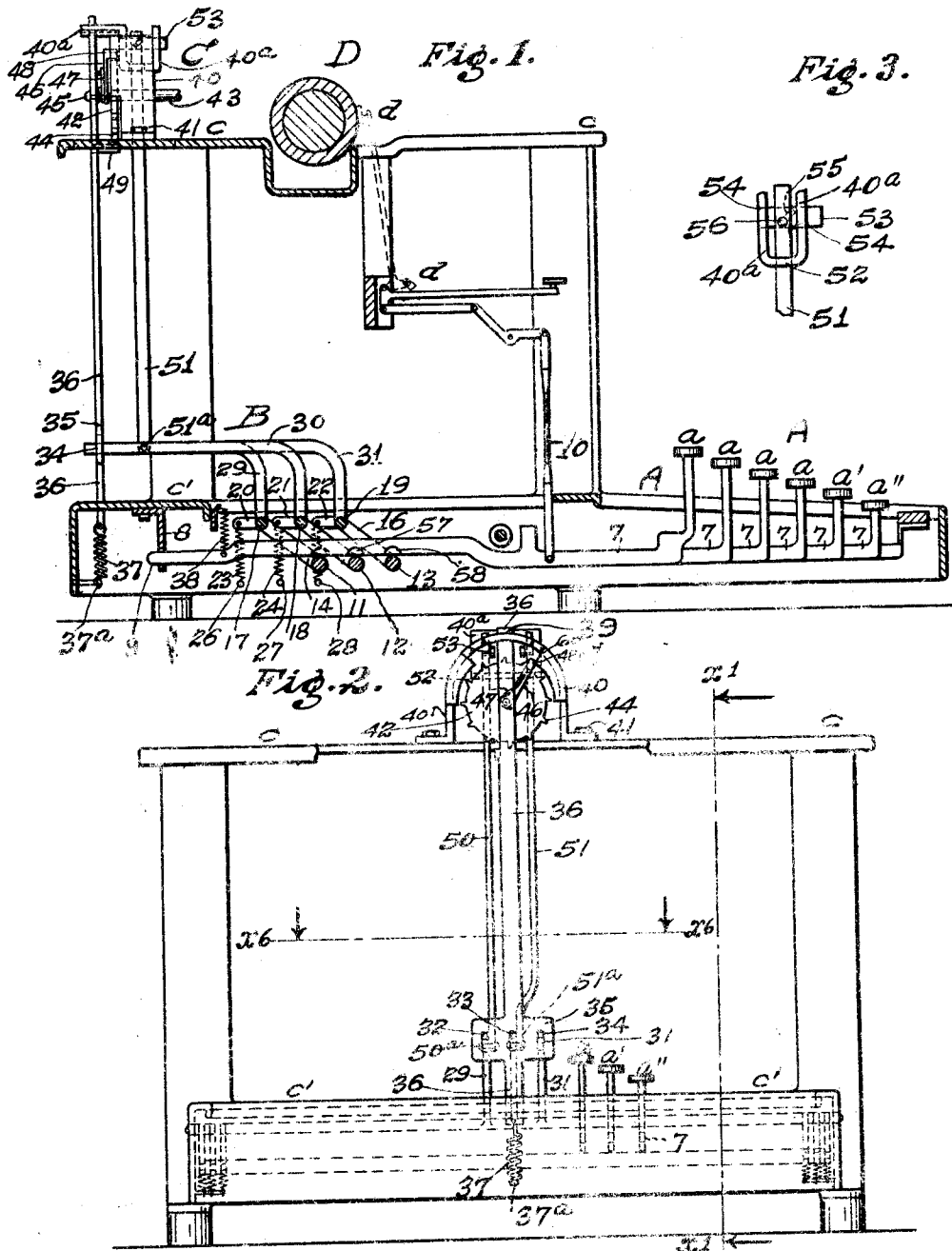


A. W. RICHES.
 ESCAPEMENT MECHANISM FOR TYPE WRITERS.
 APPLICATION FILED JUNE 5, 1912.

1,100,844.

Patented June 23, 1914.

2 SHEETS-SHEET 1.



Witnesses:

A. Kraybill.
 W. J. Seemann.

Inventor:

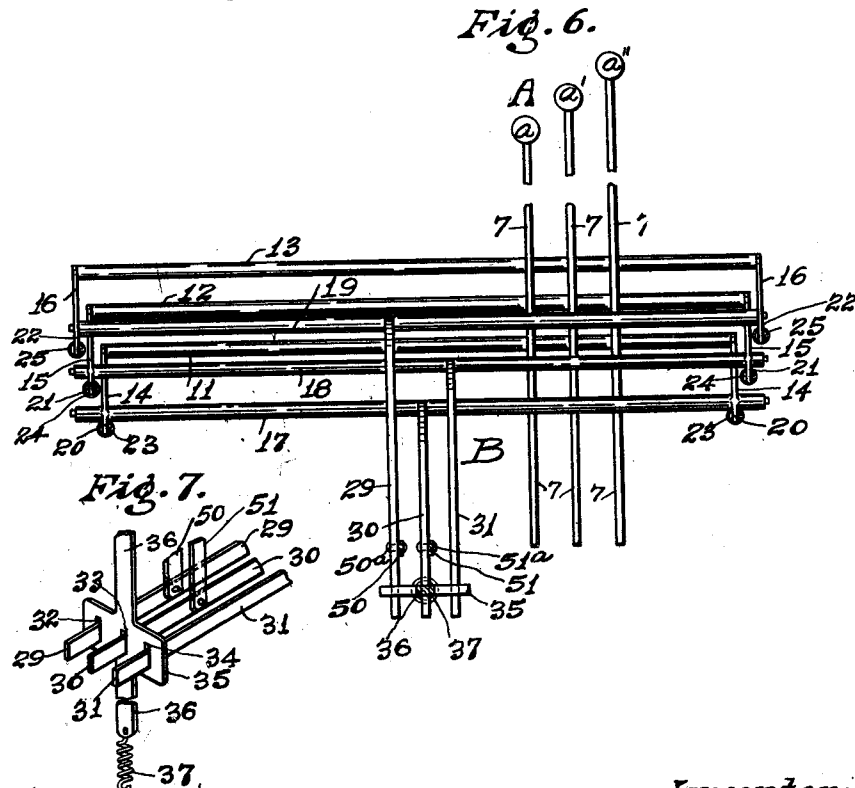
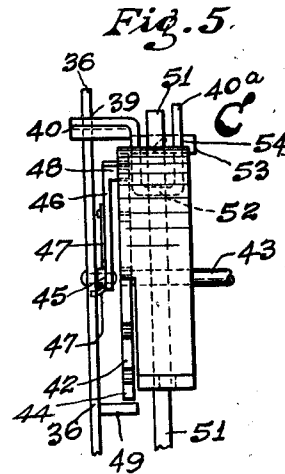
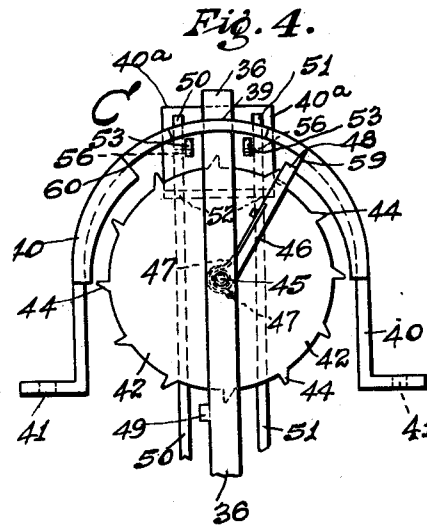
Arthur W. Riches;
 By Aiden & Seemann
 his Attorneys.

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Arthur W. Riches,
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UNITED STATES PATENT OFFICE.

ARTHUR W. RICHES, OF LOS ANGELES, CALIFORNIA.

ESCAPEMENT MECHANISM FOR TYPE-WRITERS.

1,100,844.

Specification of Letters Patent.

Patented June 23, 1914.

Application filed June 5, 1912. Serial No. 791,822.

To all whom it may concern:

Be it known that I, ARTHUR W. RICHES, a citizen of the United States, residing at No. 212 North Fremont street, Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Escapement Mechanism for Type-Writers, of which the following is a specification.

This invention relates to escapement mechanism for typewriters of that class wherein it is desired to provide an improved attachment for the printing of word groups, that may be readily attached to any standard typewriter.

An object of the invention is primarily, the provision of improvements in controlling means for typewriter escapements, which can be attached to a typewriting machine, and used for printing a plurality of words of two or three letters with greater speed and less effort on the part of the operator.

Another object of the invention is the provision of an improved attachment of the character stated, that is adaptable to any standard typewriting machine and can be used to print any predetermined two or three letter word or words; such words being printed at any desired place in any line or sentence of words, as simply as the single letters and characters are now printed.

Another object of the invention is the provision of improvements of the stated character, that can be used in combination with the single character printing means now used, in which the single characters may be printed in the customary way to form any word, and the two or three letter words may be interspersed therewith, with any predetermined group provided when the device is constructed, being used to print a two or three letter word or group to complete words commenced by the single characters or said plural letter groups may be used to print the desired word as indicated by the operating key constructed in accordance therewith, by a single stroke of the key as for any single character.

A further object of the invention is to provide an attachment operating in connection with the keyboard and the spacing mechanism of a standard typewriting ma-

chine, that is superior in relative simplicity and durability, and comparative serviceability.

With the above and other objects in view the invention consists in the new and novel provision, formation, construction, organization, combination, and relative arrangement of parts, members and features, all as hereinafter described, shown in the drawings and finally pointed out in the claims.

In the drawings:—Figure 1 is a sectional view of a standard typewriter embodying the invention, such view being taken on the line X¹—X¹ of Fig. 2; Fig. 2 is a rear view of the typewriting machine embodying the invention exteriorly showing the parts shown in Fig. 1; Fig. 3 is a fragmentary view to an enlarged scale of a part of the escapement mechanism; Fig. 4 is a fragmentary view to an enlarged scale of the escapement sprocket and its parts as shown in Fig. 2; Fig. 5 is a side elevation of the showing made in Fig. 4; Fig. 6 is a fragmental top plan view of the operating means; and Fig. 7 is a perspective view to an enlarged scale of a portion of the operating means.

Like characters of reference denote like parts throughout the several views of the drawings.

Referring more particularly to the drawings, the letter A designates the keyboard of a typewriter provided with the usual levers 7 extending from the keys *a* to the operating means B. The escapement mechanism C is located on the upper rearward portion of the frame standards *c*.

D is the customary platen in connection with which the type-carrying-bars *d* operate to print in accordance with the well established practice and such platen and its carriage are connected with the standard means not shown, customarily employed to move the platen transversely across the typewriting machine for the necessary spacing of the printed characters.

The keys *a* of the keyboard A have the relatively long arms 7 extending therefrom to a standard 8 depending from the portion *e* of the frame standards *c* and are designed to operate in the slots 9 provided in the standard 8.

The customary type-carrying-bars *d* are

provided with the connecting-rods 10 fastened to each of the long arms 7.

The escapement operating means B comprises the transverse rods 11, 12 and 13 which are disposed directly beneath the long arms 7, and the integral links 14, 15, and 16, at each end of said rods extend to the ends or adjacent the ends of the supplemental transverse rods 17, 18 and 19 where the ends of said links are provided with the arms or lugs 20, 21 and 22 projecting therefrom. Tension springs 23, 24 and 25 are fastened to said lugs and to the frame standard as at 26, 27 and 28. Formed integrally with or fastened on the rods 17, 18 and 19, are arms 29, 30 and 31 which extend preferably upwardly and thence rearwardly of the typewriting machines where their ends are movably guided in the slots 32, 33 and 34 in the plate 35; such plate 35 being provided preferably as a part of the operating stem 36 which is designed to be moved upwardly and downwardly by the arms 29, 30 and 31 operating in the slots 32, 33 and 34. In order to return the stem 36 to its normal position the spring 37 is in tension at its lower end and such spring 37 is fastened to a part of the frame standard as at 37^a.

A series of springs 38 may be provided, one in connection with each of the long arms 7, this facilitating the actuation of the arms so that they will always return when the keys *a* are released from pressure, to normal position as shown in Fig. 1.

The escapement mechanism C comprises the operating-stem 36 extending from the operating means B to a guiding-slot 39 in the guide-standard 40 which may be cast or formed integrally of the frame standards thereto as at 41. The sprockets 42 customarily used in all typewriting machines, having a shaft 43 with which the necessary platen mechanism, not shown, is connected to move the platen transversely of the machine when the sprocket-teeth 44 are disengaged. With particular reference to Figs. 4 and 5 of the drawings, the operating-stem 36 is shown as being spaced away from the sprocket 42 and extending parallel to the vertical plane of its rear face; such stem 36 having pivotally fastened thereto at a point in registration with the center of the sprocket as at 45, the radial arm 46 having a spring 47 thereon and also having at its end the dog 48 for engagement with the teeth 44. The dog 49 projecting from the stem 36 is designed to engage the sprocket teeth 44 when the stem 36 is moved upwardly by either one of the arms 29, 30 or 31 of the operating means B being moved and the dog 48 is at the same time disengaged from the teeth 44.

The rod 50 is pivotally connected as at 50^a to the arm 29 and the rod 51 is fastened in a like manner as at 51^a to the arm 30, both such fastenings being adjacent the stem 36; such rods 50 and 51 being guided in the openings 52 in the part 40^a of the guide-standard 40 and provided with the dogs 53 in the slot 54 which latter are provided with the diagonal slots 55 through which extend the pins 56 fastened in said rods 50 and 51.

The long arms 7 are each provided with the clearance slots 57 and 58 for the purpose hereinafter more fully described.

The shoulder 59 of the standard 40 against which the radial arm 46 and its dog 48 normally rest, is so designed as to hold the sprocket 42 from rotation and to allow the dog to be disengaged from the teeth 44 of the sprocket 42 when the spring 47 will move the arm until it is stopped by one of the dogs 53 or by the shoulder 60 also provided in the standard 40. When the dog 48 is disengaged then the sprocket may rotate until it is stopped from rotation by the dog 49 engaging therein and between such disengagement of the dog 48 and the engagement of the dog 49 the sprocket 42 travels approximately one-third of the distance between any two of the teeth 44.

A brief statement of the operation of the parts comprising the invention, is as follows:—The keyboard of the usual single printing characters is provided and any predetermined number of keys to print two or three letter characters or words may be provided in any plurality of rows added to such keyboard, preferably in front of said single character keys as shown in the drawings. When it is desired to print any single character, the key indicating such character to be printed is pressed downwardly in the usual way by using a finger of either hand, which causes the long arm 7 to move downwardly and thus engage the rod 11; the clearance slots 57 and 58 being provided for the purpose of allowing the rods 12 and 13 to enter therein so that said last mentioned rods will not be moved, and the link 14 turns the rod 17 thereby moving the end of the arm 30 upwardly in the slot 33 to engage in the upper end of said slot 33, thus moving the stem 36 upwardly and likewise the rod 51 upwardly, which releases the dog 48 of the arm 46 from engagement with the sprocket 42; such arm 46 then being moved by the spring 47 to the first of the dogs 53 thereby allowing the sprocket to be turned by the platen mechanism, until one of the teeth 44 of said sprocket is engaged by the dog 49, all of which is done while the key has been pressed downwardly and while the printing has been done. The rod 51 is so

adjusted in its movement that the dog 53 is projected into the path of radial travel of the arm 46 and its dog 48 is thereby engaged or stopped against further forward movement while the sprocket is held against rotation by the dog 49 being brought into engagement with the first tooth of the sprocket next in line when the dog 48 was first released. When the pressure is released from the key and it is allowed to travel upwardly to its normal position being assisted by the spring 38 provided for that purpose, the stem 36 is moved downwardly and the dog 48 is thereby brought into engagement with the sprocket tooth next in line to the one it was just released from when the key was pressed downwardly, such engagement of the dog 48 taking place at the same time the dog 49 is disengaged from the sprocket, thereby allowing the sprocket to be turned from one tooth to the next adjacent tooth of the sprocket; the arm 46 being moved by the rotation of the sprocket for the necessary spacing of the next character to be printed and being stopped against rotation by the dog 48 being brought into engagement against the shoulder 59 of standard 40.

To print a two letter character or word the key of the series *a'* indicating the particular character desired is depressed as hereinbefore described for the single character, such depression of said key moving the long arm 7 and pulling downwardly on the type-connecting-rod 10, which operates the type-carrying-bars *d* thereby performing the printing operation; such long arm 7 also pulling downward the transverse rod 13 which through the medium of the links 15 turns the supplemental rod 19, thereby raising the arm 29 in the plate slot 32. The rod 50 has thereby been moved upwardly, thus moving the pin 56 in the slot 55 and moving the dog 53 into the path of radial travel of the arm 46 and its dog 48, so that when the maximum downward movement of the key *a'* has been reached, the end of the slot 32 has been engaged by the end of the arm 29, which engagement has moved the stem 36 upwardly to disengage the dog 48 from the sprocket 42, at the same time that the dog 49 is moved upwardly to engage in the sprocket. The sprocket rotates approximately one-third of the distance from one tooth to another during the time of its disengagement from the dog 48 and its engagement by the dog 49 as the keys *a'* are pressed down and the arm 46 moved under pressure of the spring 47, brings said arm and its dog 48 against the dog 53, such dog 53 being projected prior to the time of the disengagement of the dog 48 from the sprocket. When the pressure employed to move or hold the key down is removed, the dog 48 is

brought into engagement with the sprocket and travels the distance of two of the teeth 44, not less the distance of travel on the downward pressure of the key, thereby providing a space double that hereinbefore described for the single characters. The sprocket is rotated whenever the dogs 48 or 49 are disengaged therefrom by the momentum of the platen operating mechanism not shown, and the dog 48 stops the rotation of the sprocket by engaging on or in the shoulder 59, until such time as another of the keys *a*, *a'* or *a''* are depressed. The slots 57 and 58 in the long arm 7 are so arranged in this instance that the long arm will not move the rods 11 and 12 which enter into said slots.

To print a three letter character or word group, or a character embodying a three letter space, one of the series of keys *a''* corresponding with the word or character it is desired to print, is depressed, which moves the long arm 7 to operate the type-bars *d* as hereinbefore described and said long arm 7 having the slots 57 and 58 so arranged that it will not move the rods 11 and 13 but will press downwardly on the rod 12, thus through the medium of the links 15 turn the rod 18 which creates upward movement of the arm 31 in the plate slot 34, and further downward pressure of the key *a''* causes the arm 31 to engage the plate 35 at the upper end of the slot 34, thereby moving the stem 36 upward to disengage the dog 48 and engage the dog 49 as hereinbefore described for printing single characters and also for printing two letter characters or word groups as hereinbefore described. As the stem 36 is moved upward the dog 48 is released from engagement with the sprocket and the pressure of the spring 47 swings the arm 46 radially of the teeth of the sprocket so that it moves to the shoulder 60 as the dog 49 is brought into engagement for the printing operation while the sprocket 42 has been rotated to bring the following tooth 44 into engagement with said dog 49 as is clearly shown in Fig. 4 of the drawings. When the key is released from pressure at its downward position the stem is moved downwardly thus bringing the dog 48 into engagement with the third tooth following the tooth it was released from by the depression of the key *a''* as just set forth; the spacing operation thereby takes place in steps when the key is depressed and when it is released as hereinbefore described for single and double characters.

The invention may be used to print any desired number of one, two or three letter characters in succession or any one, two or three letter characters may be printed at any desired place in any word or in any

portion of a word previously printed by any other characters, either singular or plural.

Particular attention is given the escapement means C with regard to the spacing, which is what I term step spacing. It is found that all standard typewriting machines now on the market which have been made recently, are provided with spacing means for providing a part of the space when the character keys are depressed and the remainder or completion of the spacing operation takes place when the key is released. This step spacing means is provided so as to minimize the shock that the platen and the carriage would be subjected if the spacing take place in one operation, when a plural lettered group is printed, which thereby increases the term of usefulness of the machine.

In conclusion I do not desire to be understood as limiting myself to the specific provision, formation, construction, combination, association, or relative arrangement of parts, members and features shown and described, but reserve the right to vary the same, in adapting the improvements to varying conditions of use, without departing from the spirit of the invention, and the terms of the following claims.

I claim:—

1. In a typewriter, the combination with an escapement wheel, of a fixed stop, a reciprocable dog carrier, a dog pivoted on said carrier and adapted for engagement with said stop under the action of said wheel to arrest movement of the latter, a spring causing free movement of said dog when said carrier is reciprocated in one direction to release engagement between said dog and wheel, said carrier having a detent dog for engagement with said wheel upon release of said pivoted dog therefrom, a plurality of limiting stops normally out of the path of the pivoted dog, and selective key operated mechanism for moving said limiting stops into the path of said pivoted dog to vary the free movement of said pivoted dog, substantially as described.

2. In a typewriter, the combination with an escapement wheel, of a fixed stop, a reciprocable dog carrier extending diametrically across said wheel, a dog pivoted on said carrier and adapted for engagement with said stop under the action of said wheel to arrest movement of the latter, a spring causing free movement of said dog when said carrier is reciprocated in one direction to release engagement between said dog and wheel, said carrier having a detent dog for engagement with said wheel upon release of said pivoted dog therefrom, and selective key operated mechanism for varying the free movement of said pivoted dog, said selective mechanism

including a plurality of stops normally out of the path of said first mentioned dog and means to move one of said stops into said path.

3. In a typewriter, the combination with an escapement wheel, of a reciprocable dog carrier, a dog movably mounted on said carrier and adapted for wheel arresting movement under the action of said wheel to arrest the latter and adapted for free movement with respect to said wheel when said carrier is reciprocated in one direction, said carrier having a detent dog for engagement with said wheel upon movement of said carrier to release said movable dog therefrom, and selective key operated mechanism for limiting the free movement of said first named dog to vary the spacing movement of said wheel, said selective mechanism including a plurality of stops normally out of the path of said first mentioned dog and means to move one of said stops into said path.

4. In a typewriter, the combination with an escapement wheel, of a fixed stop, a plurality of dogs adapted for alternate engagement with said wheel to limit movement thereof, one of said dogs coacting with said stop under the action of said wheel to limit movement of said wheel and being freely movable with respect to said wheel when released therefrom, and mechanism for varying the free movement of said last named dog for controlling its reengagement with said wheel to vary the spacing movement thereof, substantially as described, said mechanism including a plurality of stops normally out of the path of movement of said last mentioned dog and means to move a selected stop into said path.

5. In a typewriter, the combination with single and word type operating keys, of an escapement wheel, escapement mechanism operable by any of said keys for limiting movement of said wheel and including a movable dog, and means operable by said word type keys for varying the action of said escapement mechanism on said wheel with respect to the axis thereon upon depression of said single type keys, said means including a plurality of stops normally out of the path of said movable dog, one of said stops being operable by the depression of the single type keys and the remainder of said stops being operable by depression of certain of the word operating keys to move into the path of said dogs.

6. In a typewriter, the combination with an escapement wheel, of a pair of dogs adapted for alternate engagement therewith to limit movement of said wheel, one of said dogs having a fixed path of movement to provide a fixed preliminary and partial spacing prior to impression of the type, the

other dog having a variable movement to provide for greater or less spacing subsequent to impression of the type, single type and word type keys, and automatically acting selective mechanism operated upon depression of any of the keys for actuating one dog to affect a fixed preliminary spacing and serving to vary the action of the remaining dog on release of the keys to impart the

required greater or less spacing subsequent to an impression. 10

In testimony whereof, I have signed my name to this specification in the presence of the two subscribing witnesses.

ARTHUR W. RICHES.

Witnesses:

W. F. SEEMAN,

F. G. HENTIG.