A. T. BROWN.

TYPE WRITING MACHINE.

APPLICATION FILED DEC. 10, 1906.

985,506. Patented Feb. 28, 1911.

3 SHEETS—SHEET 1.

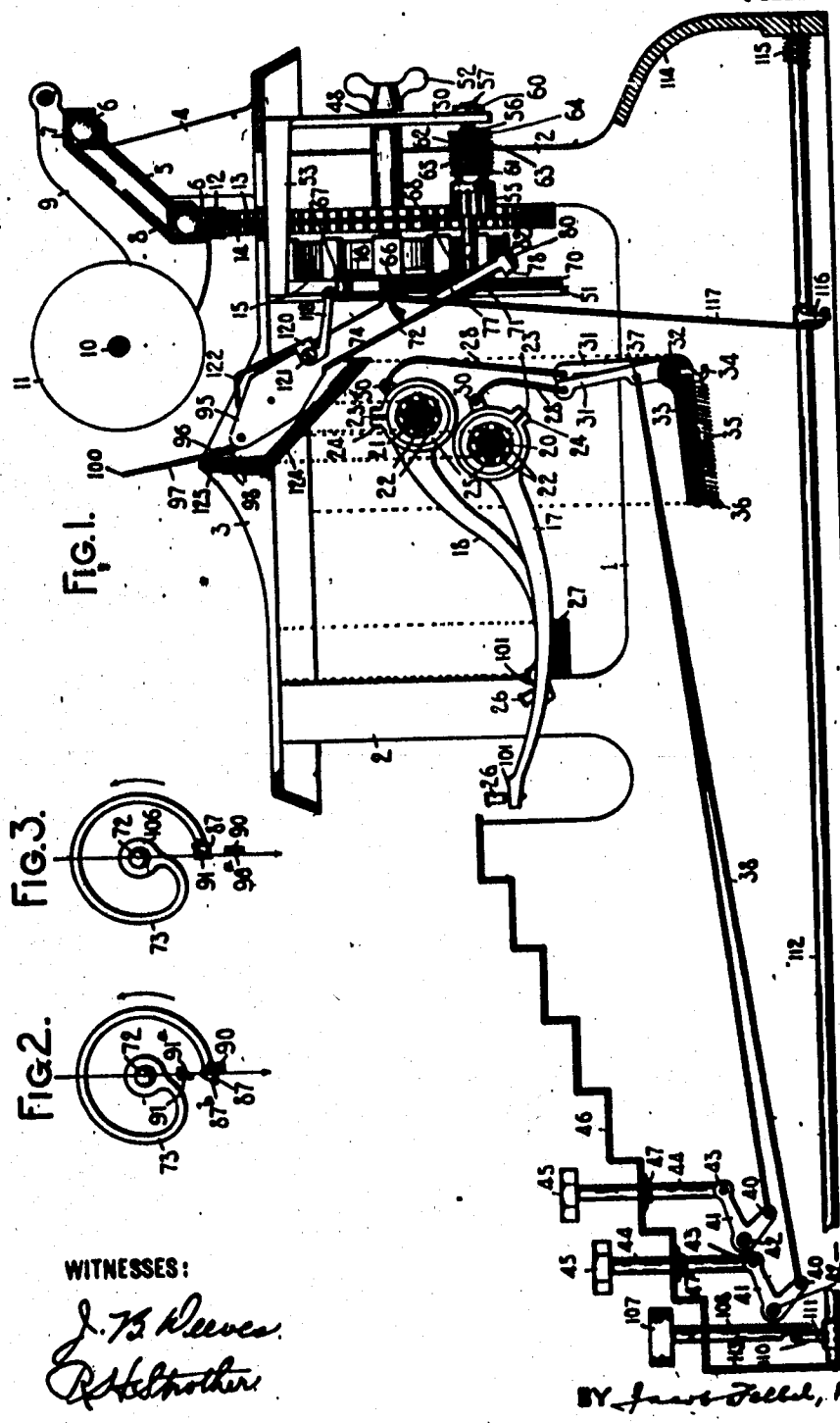

FIG. 1.

FIG. 3.

FIG. 2.

WITNESSES:

J. B. Reeves

R. H. Strother

INVENTOR

A. T. Brown

BY James Reed, ATTORNEY

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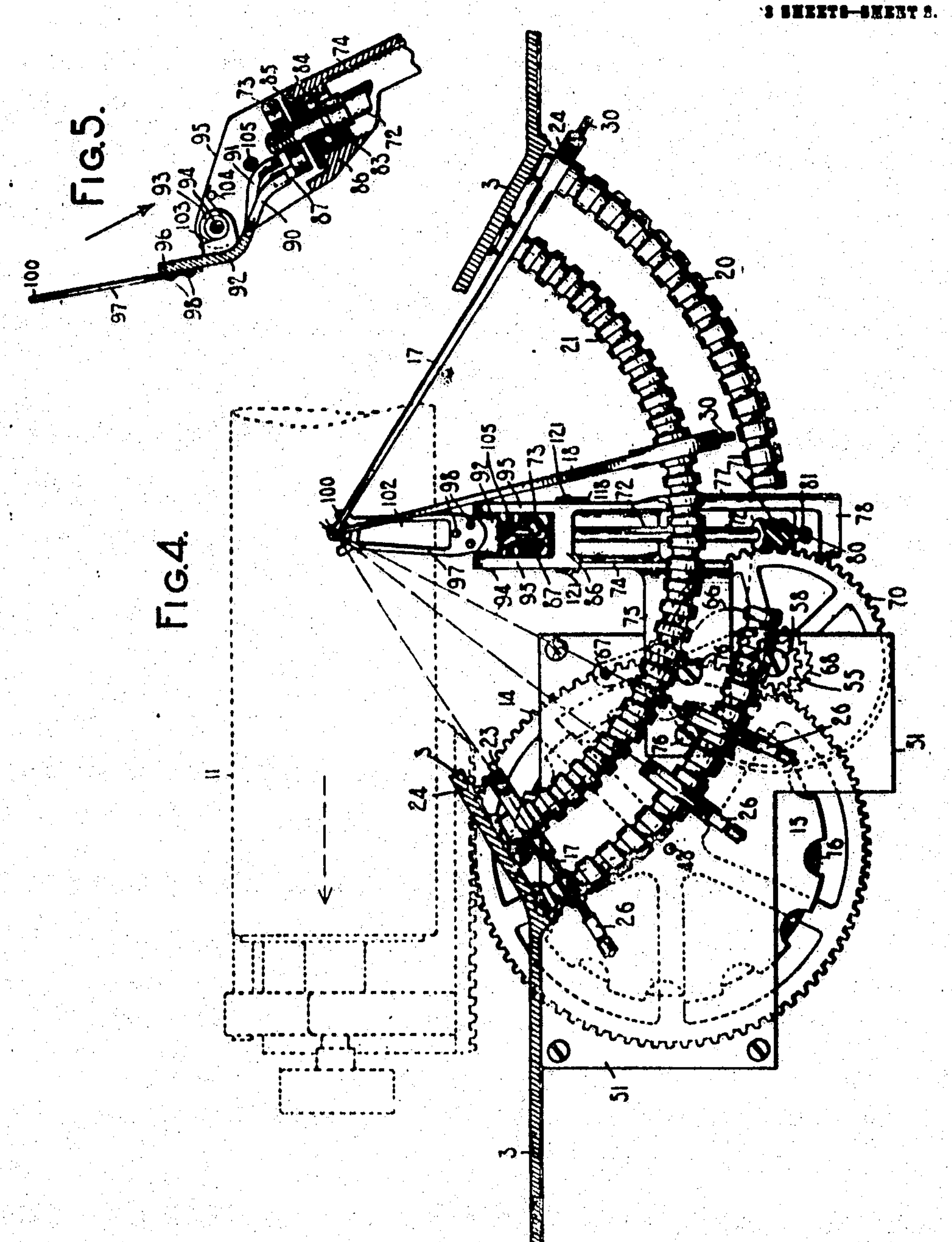
3 SHEETS—SHEET 2.



WITNESSES:
J. B. Deeves
R. H. Strother.

INVENTOR.
Alexander T. Brown
BY
Jacob Felbel
ATTORNEY.

A. T. BROWN.

TYPE WRITING MACHINE.

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3 SHEETS—SHEET 3.

FIG. 6.

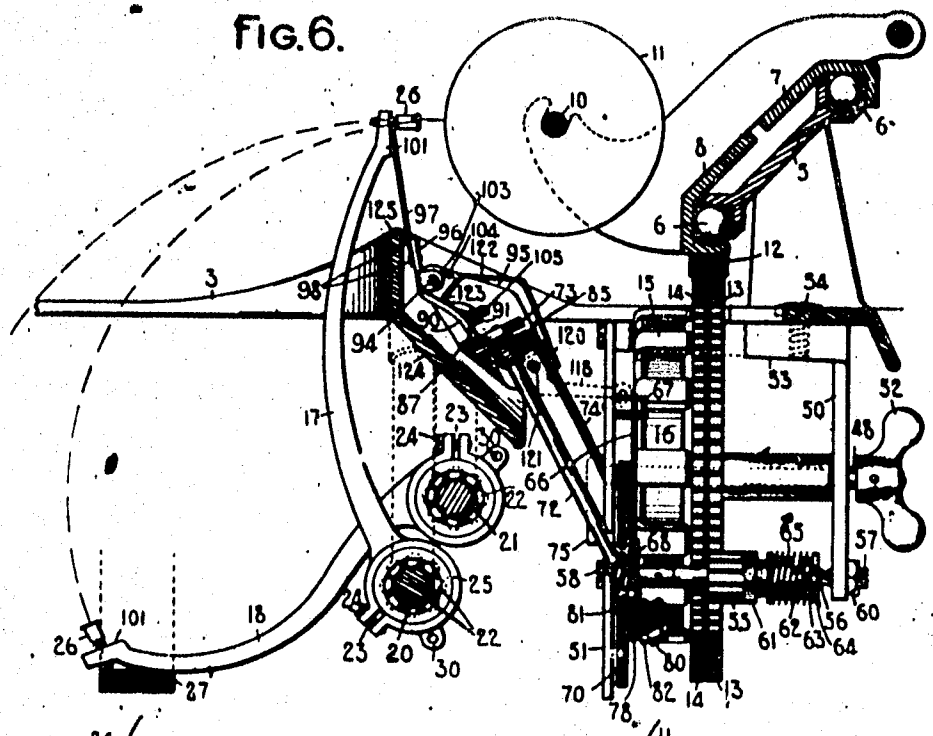


FIG. 7.

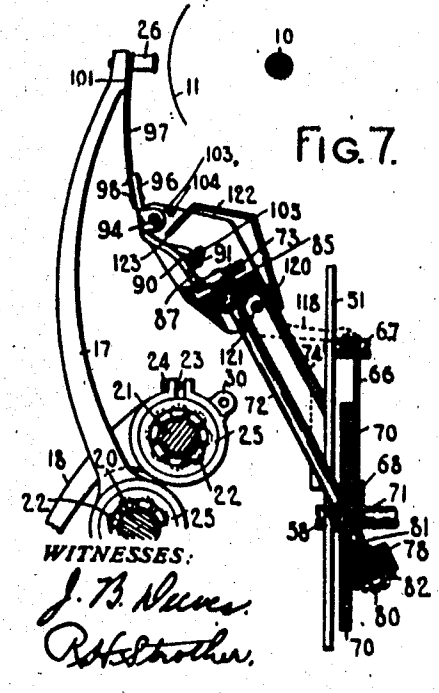
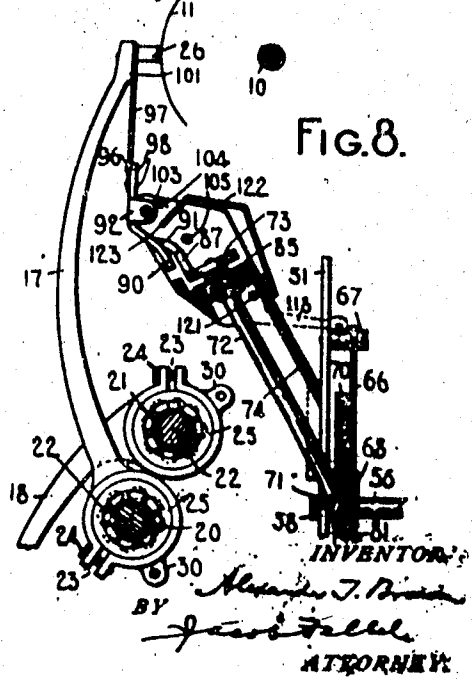


FIG. 8.



WITNESSES:

J. B. Nunes

R. H. Strother.

INVENTOR:

Alexander T. Brown

BY

Jacob Fahle

ATTORNEY.

UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

TYPE-WRITING MACHINE.

985,506. Specification of Letters Patent. Patented Feb. 28, 1911.

Application filed December 10, 1906. Serial No. 347,104.

To all whom it may concern:

Be it known that I, ALEXANDER T. BROWN, citizen of the United States, and resident of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and especially to carriage feed mechanism of such machines.

My invention has for its principal object to provide an improved escapement mechanism and connections and said invention consists in the features of construction and combinations and arrangements of parts, all of which will be fully set forth herein and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a front to rear vertical sectional view of a typewriting machine having my invention embodied therein, said view showing only so much of said machine as is necessary to illustrate the invention. Figs. 2 and 3 are detail views of the escapement mechanism looking in the direction of the arrow in Fig. 5, the views showing the rotary toothed device that is connected with the carriage and showing the feed dogs in section, the parts being shown in different positions in the two views. Fig. 4 is a front elevation of the escapement mechanism and of some of the associated parts of the typewriting machine, the top plate of the latter being shown in section. Fig. 5 is a fragmentary detail view of the escapement which is shown in section on a vertical plane extending fore and aft of the machine through the center of said escapement. Fig. 6 is a fragmentary central fore and aft vertical sectional view of the upper rear part of the typewriting machine on a somewhat larger scale than Fig. 1. Figs. 7 and 8 are views similar to Fig. 6 but with the parts in different positions and some of the parts shown in said Fig. 6 omitted.

Some of the features of my invention are applicable to typewriting machines generally but some of the features are more especially designed for use in a front-strike or "visible" typewriter and I have accordingly illustrated the invention applied to such a machine.

The main frame of the machine shown in the drawings comprises side plates 1 from which rise posts 2 that support a top plate 3. Standards 4 rising from said top plate support a stationary carriage rail 5 which is inclined upward and toward the back of the machine as shown in the drawings. This carriage rail has in its front and rear edges grooves in which run anti-friction balls or rollers 6 which coöperate with carriage rails 7 and 8. Said carriage comprises said carriage rails and also end pieces 9 supported by said rails and carrying the shaft 10 of a platen 11. The lower carriage rail 8 has a feed rack 12 fixed to its under side and said feed rack meshes with two gear wheels 13 and 14. A spring drum 15 having a driving spring 16 coiled therein is mounted by the side of the gear wheel 14 which is suitably connected with the inner end of said spring 16 to drive the carriage in letter space direction and the gear 13 is geared to the escapement mechanism as will hereinafter more clearly appear. The carriage mounting herein shown and briefly described is not claimed in this application but is claimed in my prior Patent No. 910,987, dated January 26th, 1909.

The printing instrumentalities comprise two sets of type bars 17 and 18 mounted respectively on grooved rods 20 and 21 which are mounted at their ends on the under side of the top plate as best shown in Fig. 4. Each of the peripheral grooves in the segments 20 and 21 serves as a ball race for anti-friction balls 22 which coöperate with ball races in eyes formed in the pivotal ends of the type bars. This grooved segment construction supporting ball bearing type bars in the general way herein shown is claimed in my Patent No. 962,418, granted June 28th, 1910. In the present instance the type bars are mounted on two segments, one of which is nearer to the printing point and to the back of the machine than the other, the type bars on one segment alternating with those on the other. As shown in the present instance the eye of the type bar comprises a strap which is cut through at 23, the two ends of the strap being connected together by a tightening screw 24 and the ball race consists of two coned rings 25 threaded into the eye of the type bar and retained in adjusted position by tightening the screw 24. This form of ball bearing type bar is not of my invention but is the invention of John H. Barr. Each of the type bars carries at

its free end a type block 26 with a single type thereon and all of the type bars normally rest against a segmental pad 27.

The type bars are thrown to the printing point by links 28 pivotally connected with ears 30 projecting from the heels of the type bars, said links 28 extending from said type bars in directions approximately radial of the type bar segments. Each of the links 28 at its outer or lower end is pivoted to the upper end of a sub-lever 31, said sub-lever being also arranged substantially radially of the type bar segments and all of them being pivoted on a pivot wire 32 that lies in a slot in a sub-lever segment 33 which passes around the type bar segment and is secured at its ends to the under side of the top plate 3. The rear edge of the segment 33 is formed with a series of radial slots, each of the sub-levers 31 being mounted in one of said slots. Each of said sub-levers has a depending arm 34 to which is connected the rear end of a returning spring 35, the forward end of which is connected to a hook 36 secured to the front edge of the segment 33. Each of the sub-levers 31 has pivoted thereto at 37 a forwardly extending link 38, the forward end of which is pivoted at 40 to one arm of a bell-crank lever 41, said levers being piv ted on transverse pivot rods 42 suitably supported in the framework of the machine. Each of the bell crank levers 41 has pivoted thereto at 43 the lower end of the stem 44 of a printing key 45. All of the stems 44 pass through suitable openings in a plate 46 which is of the general stepped form shown in the drawings and which is suitably secured to the side plates 1. The construction is such that when any of the keys 45 is depressed the corresponding link 38 will be drawn toward the front of the machine and the corresponding sub-lever 31 will be drawn toward the front of the machine, thus actuating the corresponding type bar through the link 28. When the key is released the parts are restored to normal position by the returning spring 35 and they are arrested in normal position by a collar 47 secured to the key stem and contacting with the under side of the plate 46. The key action just described is not of my invention but is the invention of John H. Barr.

The gear wheels 13 and 14 are both loosely mounted side by side on a shaft 48 (Fig. 6) that is journaled in two frame plates 50 and 51 which are mounted below the top plate 3 and said gear wheels extend upward through a suitable slot in the top plate. The spring drum 15 is rigidly mounted on said shaft 48 and said shaft carries at its rear end a winged finger piece 52 by turning which the tension of the spring 16 may be regulated, the shaft being held in its adjusted position by suitable pawl and ratchet mechanism not shown. The frame plates 50 and 51 constitute parts of a framework which supports the entire escapement mechanism and which is secured as a whole to the under side of the top plate. The plates 50 and 51 are connected together by two cross pieces 53, each of which is secured to the under side of the top plate by a screw 54 which passes downward through said top plate and is threaded into the cross piece. The construction is such that the carriage feed mechanism including the escapement mechanism may be assembled as an entirety and may be placed as an entirety in the machine and secured in position by the screws 54. I have not herein shown the connection between the inner end of the spring 16 and the gear wheel 14. The gear wheel 13 meshes with a pinion 55 which is mounted on a shaft 56, which is journaled at its ends on coned screws 57 and 58 threaded through the frame plates 50 and 51 respectively. The screw 57 is provided with a lock nut, 60. The pinion 55 is free to turn on the shaft 56 but is not free to move endwise of said shaft. The rear face of said pinion has ratchet clutch teeth formed therein, each tooth having one inclined and one abrupt face and said clutch teeth mesh with corresponding clutch teeth on the front face of a sleeve 61 which is free to slide along the shaft 56 and which has a tooth 62 projecting from its rear face into a slot 63 formed in an enlargement 64 of the shaft 56 so as to lock the sleeve and shaft to rotate together. The construction is such that the sleeve 61 may slide along the shaft 56 until the clutch teeth are out of engagement but the tooth 62 playing in the slot 63 prevents relative rotation of the sleeve and shaft. The sleeve is normally held in its forward position with the clutch teeth in engagement by a spring 65 coiled about the enlargement 64 and the sleeve 61 and compressed between flanges on these parts. The construction is such that when the carriage is moving in letter space direction the sleeve 61 and shaft 56 are constrained to turn with the pinion 55 but when the carriage is being drawn toward the right the ratchet clutch teeth will permit the pinion 55 to turn independently of the shaft. In this return motion the shaft is positively held against rotation by a gravity pawl 66 which is pivoted to the frame plate 51 by a pivot screw 67 and the free end of which engages a ratchet wheel 68 fixed to the shaft 56.

Near its forward end the shaft 56 has a worm gear 70 which meshes with a worm 71 fixed on the lower end of a shaft 72 which inclines upwardly and toward the front of the machine and has a rotary toothed device 73 mounted on its upper end for coöperation with the feed dogs as will presently

appear. The shaft 72 is supported by a bracket 74, an arm 75 of which is secured by screws 76 to the front face of the frame plate 51, as best shown in Fig. 4. The bracket 74 comprises a downwardly and rearwardly extending arm 77 (Figs. 1 and 4) having at its lower end a lug 78 through which is threaded a screw 80 (best shown in Fig. 6), the upper end of which is formed with a central longitudinal bore in which the reduced end 81 of the shaft 72 is journaled. The screw 80 is provided with a lock nut 82. As best shown in Fig. 5 the upper end of the shaft 72 receives a support from a ball bearing which comprises a coned bearing surface 83 formed on the shaft for coöperation with anti-friction balls 84 that run in a cup-shaped bearing 85 which is threaded into an opening in a transversely disposed part 86 of the bracket 74 near the upper end of said bracket. The shaft 72 and its ball bearing are adjusted by screwing the cup 85 and the screw 80 up or down.

As best shown in Fig. 5, the rotary toothed device 73 is threaded on to the upper end of the shaft 72 and as shown in Figs. 2, 3 and 5, this device has a single upwardly extending tooth 87 which coöperates with two feed dogs 90 and 91 projecting from and fixed to or forming part of a rocker 92 having rearwardly extending ears 93 pivoted on a rod 94 between two upwardly and forwardly extending branches 95 of the bracket 74 in which branches of said bracket said rod or pin 94 is mounted. The rocker 92 comprises an upwardly extending arm 96 to which an arm 97 is secured by rivets 98. The arm 97 is made of light spring metal and its upper end is formed into a segmental universal bar 100 which, when said universal bar is pressed toward the rear of the machine, as shown in Fig. 8, has the center on which the arc of the segmental bar is struck directly in front of the printing point, as shown in Fig. 4. This universal bar 100 is adapted to be struck by contact parts 101 on the several type bars just inside the type 26. The central port of the arm 97 is cut away as shown at 102 (Fig. 4) for the sake of lightness and also to add to the flexibleness of the arm. The rocker 92 is controlled by a spring 103 coiled about the rod 94 and bearing at one end against one of the ears 93 and at the other end against a pin 104 projecting from the inner face of one of the branches 95 of the bracket 74. The tension of this spring is exerted to move the upper end of the rocker toward the front of the machine and the feed dogs 90 and 91 toward the rear of the machine, the motion of the parts under the impulse of said spring being limited by a cross pin 105 extending between said branches 95. The gearing between the shaft 72 and the carriage is such that one complete rotation of said shaft permits the carriage to be fed a single letter space so that only one tooth is mounted on said shaft. There are advantages due to this construction and some of my claims are directed to it but as far as some features of my invention are concerned the shaft or escapement wheel might carry more than one tooth and the gearing be proportioned accordingly.

The feed dog 91 is back of and a little to the left of the dog 90, the latter dog being normally in engagement with the tooth 87, as best shown in Figs. 2 and 5, and the dogs being rigidly connected and maintained in fixed relation. The dog 90 has a flat working face 90^a with which a corresponding working face 87^a on the tooth 87 co-acts, whereas a beveled working face 91^a on the feed dog 91 coöperates with a correspondingly beveled working face 87^b on the tooth 87. As one of the character keys is struck the corresponding type bar, just before it reaches the platen, strikes the universal bar 100 and rocks the rocker 92 to the position shown in Fig. 8, thus removing the dog 90 from in front of the tooth 87 and leaving the shaft 72 free to turn; the tooth 87 passing between the dogs 90 and 91. If the rocker 92 remains in this position until the shaft has completed its rotation the tooth 87 will strike the tooth 91 which has been moved forwardly into the path of said tooth which will be arrested by said dog until the rocker has returned toward normal position far enough to free said tooth from said dog 91 when said tooth will move into engagement with the dog 90 without affording a rotation of the shaft, the dog 90 holding the shaft until another actuation of the rocker.

In Fig. 2 the dogs 90 and 91 are shown in section and in their normal position and in Fig. 3 said dogs are shown in their operated position, the parts being in the positions they assume at a full depression of a printing key and before the shaft has rotated. As shown in these figures of the drawings the dog 91 is beveled on its right-hand face at 91^a and the tooth 87 is correspondingly beveled on its left-hand face at 87^a and the relation of these parts is such that when the universal bar is struck by a type bar the beveled face of the dog 91 will strike the beveled face of the tooth 87 and cam said tooth toward the right, thus setting the carrier 73 in motion very quickly, the dog 91 striking the tooth 87 with considerable force. The toothed carrier 73 is geared up so high that the tendency of the driving spring 15 to turn said toothed carrier is not very strong and the carriage is set in motion more promptly by the device that has just been described than it would be without it. It will be seen that when the universal bar is struck by a type bar the dog 91 strikes the tooth 87 a blow and said tooth also strikes the dog 90 a blow

at the end of the step or letter-space movement of the carriage and this latter blow is rather a sharp one because the speed of the shaft 72 is high. For these reasons the rotary device 73 is made of spring metal of the form shown in Figs. 2 and 3, said device comprising a hub 106 which is threaded on to the end of the shaft 72, the device extending outward from said hub and being coiled through the greater part of the circumference of a circle and the tooth 87 being bent up from the free end of this coil. Said tooth 87 is thus connected with the shaft 72 by a long resilient arm. As far as I am aware this spring mounting of the tooth is new whether there be one tooth or more than one on the tooth carrier. The universal bar 100 is also struck a sharp blow as said universal bar is operated practically by the free end of the type bar. The effect of this blow on the universal bar is illustrated in Figs. 6, 7 and 8, Fig. 6 showing the position of the parts at the instant when the type bar first encounters the universal bar, Fig. 8 showing their position at the instant when the type strikes the paper and Fig. 7 showing an intermediate position. As shown in Fig. 7 the first effect of the blow of the type bar against the universal bar is to bend the spring arm 97. This arm quickly recovers its normal shape, thus giving a sharp quick action to the dogs and a quick start to the tooth-carrier 73. The resiliency of the arm 97 causes said arm to absorb less of the energy of the type bar and adds to the effectiveness of the beveled dog 91 on the tooth 87 and it also greatly lessens the noise due to the blow of the type bar against the universal bar. The resiliency of this arm and the returning spring 103 also assist in giving a quick return to the type bar, the universal bar acting as a spring repulser.

In many type-writing machines, if, when a key is struck, the operator is a little slow to release it, the type bar rebounds from the platen and then strikes it a second time, thus causing double printing. This is prevented in the present machine by the universal bar, the spring 103 of which is sufficient to prevent the type from striking the paper a second blow, the inherent resiliency of the spring arm 97 assisting in providing against a second imprint or "ghost" as it is sometimes called.

I have provided a space key 107 (Fig. 1) in the key-board of the machine, said space key being mounted on the upper end of a stem 108, the lower end of which is pivoted at 110 to an arm 111 projecting from a rock shaft 112 which is pivoted at its forward end in a front plate 113 and at its rear end in a back plate 114 of the main frame of the machine. Near its rear end the shaft 112 is provided with a returning spring 115 coiled about the shaft and connected at one end with said shaft and at the other end with the back plate 114. The rock shaft 112 has an arm 116 projecting therefrom on the opposite side thereof from the arm 111, so that when said shaft is rocked by the depression of the space key 107 the free end of the arm 116 is elevated. At its free end said arm has pivoted thereto the lower end of a link 117, the upper end of which is pivoted to an arm 118 forming part of a rocking frame 120 that lies across the back of the bracket 74. The frame 120 has two ears bent downward and forward therefrom which are pivoted to the bracket 74 on a screw or screws 121 threaded into the sides of the bracket. Said rocking frame comprises an arm 122 that is bent in the manner shown, for example, in Fig. 6, so that its free end 123 lies above and back of the lower arm of the dog rocker 92. The construction is such that when the key 107 is depressed the arm 118 is elevated, rocking the frame 120 about its pivot and depressing the forward end of the arm 122 and operating the dog rocker to effect a letter space feed of the carriage. As shown in the present instance the frame 120 is made of sheet metal and the arm 122 is of such breadth as to cover up the bearing at the upper end of the shaft 72, the carrier 73 and the feed dogs, and to protect these parts from dust or rubbings that may drop from the front face of the platen.

The top plate 3 of the machine comprises a part 124 (Fig. 6) that curves downwardly and is inclined downward and toward the rear of the machine in such fashion as to cover up the type bar bearings and to protect said bearings from dust or dirt falling from the front face of the platen. This dust guard 124 has a semi-conoidal form and extends farther toward the front of the machine than the front face of the platen and has a vertical part 125 of segmental form. The bracket 74 extends behind and above this dust guard, the escapement being above the semi-conoidal part 124 and behind the vertical part 125. A top plate forming a dust guard in the general manner of the one here shown is claimed in my prior Patent No. 971,721, dated October 4th, 1910. The particular form of dust guard shown in the present instance is not of my invention but is the invention of C. E. Tomlinson.

It is obvious that the arm 73 might be equipped with two teeth cooperating with a single tooth on the dog rocker, instead of the reverse arrangement here shown.

Various other changes may be made in the details of construction without departing from my invention.

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

1. In a typewriting machine, the com-

bination of a carriage, a rotary device geared to said carriage to make one complete rotation at each letter space feed movement of said carriage, and an escapement device coöperative with said rotary device to afford a complete rotation of said rotary device at each operation of said escapement device.

2. In a typewriting machine, the combination of a carriage, a shaft geared to said carriage and having a single arm projecting therefrom, and means coöperating with said arm to control the feed of the carriage, the gearing being such that said shaft makes a complete rotation for each letter space movement of the carriage.

3. In a typewriting machine, the combination of a carriage, a shaft, gearing connecting said carriage and shaft so that said shaft makes a complete rotation at each letter space movement of the carriage, a tooth on said shaft, and escapement dogs cooperating with said tooth to control the feed of the carriage.

4. In a typewriting machine, the combination of a platen, a series of type bars adapted to strike said platen at a common printing point, a universal bar near said printing point in position to be struck by an operated type bar near the free end of said type bar, escapement dogs controlled by said universal bar, a shaft having a single escapement tooth thereon controlled by said escapement dogs, and gearing between said shaft and carriage such that said shaft makes a complete rotation upon each letter space movement of the carriage.

5. In a front-strike typewriting machine, the combination of a carriage having a platen mounted thereon, a series of front-strike type bars adapted to strike against the front face of said platen, a universal bar near the printing point in position to be struck by said type bars near their free ends, feed dogs connected with said universal bar, a shaft inclined upward and toward the front of the machine and having an escapement tooth on the upper end thereof, a gear near the lower end of said shaft, and gearing between said gear and the carriage.

6. In a front-strike typewriting machine, the combination of a carriage, a platen on said carriage, type bars adapted to strike the front face of said platen, escapement mechanism near the printing point and operated by said type bars, a detachable frame having an upwardly and forwardly inclined bracket, the upper end of which carries said escapement mechanism, and gearing carried by said frame and bracket and connecting said escapement mechanism with said carriage.

7. In a front-strike typewriting machine, the combination of a carriage, a platen on said carriage, type bars adapted to strike the front face of said platen, and carriage feed mechanism comprising a shaft inclined upward and forward toward the printing point and geared to said carriage, and escapement mechanism operated by said type bars and controlling said shaft.

8. In a typewriting machine, the combination of a carriage, a platen on said carriage, and carriage feed mechanism comprising a rotary shaft geared to said carriage to make a complete rotation at each letter space feed movement of said carriage, a ball bearing for said rotary device, and means for controlling said shaft.

9. In a typewriting machine, the combination with a series of type bars, of a universal member adapted to be operated by the free ends of said type bars, said universal member being light and being sensibly bendable by the impact of said type bars.

10. In a typewriting machine, the combination of a carriage, escapement mechanism for said carriage, a universal bar for said escapement mechanism located near the printing point, an arm carrying said universal bar, and type bars, the free ends of which are adapted to strike said universal bar, said arm being bendable by said type bars.

11. In a typewriting machine, the combination of a carriage, a platen on said carriage, a series of type bars adapted to strike the platen at a common printing point, a universal bar near said printing point and adapted to be struck by the type bars near their free ends, feed dogs operated by said universal bar, and a connection between said universal bar and feed dogs, said connection being bendable by said type bars.

12. In a typewriting machine, the combination of a carriage, a power device for driving said carriage, key actuated devices, and escapement mechanism operated by said key-actuated devices for controlling the feed movements imparted to said carriage by said power device, said escapement mechanism comprising a part geared to the carriage, and means whereby said key-actuated devices communicate a quick start to said geared part.

13. In a typewriting machine, the combination of a carriage, a power device for driving said carriage, key-actuated devices, and escapement mechanism operated by said key-actuated devices for controlling the feed movements imparted to said carriage by said power device, said escapement mechanism comprising a part geared to the carriage and carrying a tooth, and a feed dog operated by said key-actuated devices and arranged to strike said tooth and to impart a quick start thereto.

14. In a typewriting machine, the combination of a power driven carriage, key actuated devices, and escapement mechanism for said carriage operated by said key-actuated devices, said escapement mechanism

comprising a part geared to the carriage and carrying a tooth having an inclined face, and a feed dog operated by said key-actuated devices and having an inclined face adapted to strike the inclined face of said tooth and to give a quick start to said tooth in the direction of its feed movement by camming action.

15. In a typewriting machine, the combination of a carriage, a rotary device geared to said carriage to make a complete rotation at each letter-space feed movement of said carriage, key-actuated devices, and means operated by said key-actuated devices for controlling said rotary device and for imparting a quick start to said rotary device.

16. In a typewriting machine, the combination with a carriage and key-actuated devices, of carriage feed mechanism comprising a rotary device having a spring arm, and means operated by said key-actuated devices for imparting a quick start to said spring arm.

17. In a typewriting machine, the combination of a carriage, a rotary device geared to said carriage to make one complete rotation at each letter space feed of the carriage, said member comprising a spring arm having a tooth thereon, and a feed dog cooperating with said tooth.

18. In escapement mechanism for typewriting machines, the combination of an escapement member connected to its carrier through an interposed spring arm which is rigidly connected to the carrier and to which said member is rigidly connected, and a cooperative escapement member.

19. In escapement mechanism for typewriting machines, the combination of feed dogs, and a rotary device having a tooth mounted on a spring arm for coöperation with said dogs.

20. In a typewriting machine, the combination of a carriage, a rotary device operatively connected to said carriage, a spirally di spring arm rigidly connected to sai rotary device, an escapement member carried by said spring arm, and a coöperative key-actuated escapement member.

21. In a typewriting machine, the combination of a carriage, a platen mounted on said carriage, a series of type bars adapted to strike said platen at a common printing point, escapement mechanism for the carriage including a dog rocker, and a spring arm mounted on said dog rocker and extending therefrom toward said printing point and having its upper end adapted to be struck by any of said type bars near the free end of said type bar.

22. In a typewriting machine, the combination of a carriage, carriage feed mechanism comprising a dog rocker near the printing point, a space-key in the keyboard of the a rock shaft extending longitudinally of the machine and operated by said space key, a link extending upwardly from said rock shaft, and means whereby said link operates said dog rocker.

23. In a front-strike typewriting machine, the combination with a carriage, a platen carried thereby, carriage escapement devices situated at least in part below the front face of the platen, and a part which extends above and is coöperative with said escapement devices and acts as a dust shield to prevent rubbings or falling particles of dust or grit from dropping on the escapement devices.

24. In a front-strike typewriting machine, the combination with a carriage, a platen carried thereby, carriage escapement devices situated at least in part below the front face of the platen, and a key-operated actuating device which extends above and is cooperative with said escapement devices and acts as a dust shield to prevent rubbings or falling particles of dust or grit from dropping on the escapement devices.

25. In a typewriting machine, the combination of a carriage, escapement mechanism for controlling the feed of said carriage, a space key, and connections between said space key and said escapement mechanism comprising a part which serves as a dust guard for a part of said escapement mechanism.

26. In a typewriting machine, the combination of a carriage, escapement mechanism for said carriage, and means for operating said escapement mechanism comprising a combined operating lever and dust guard for a part of said escapement mechanism.

27. In a front-strike typewriting machine, the combination of a carriage, type bars, escapement mechanism situated below the printing point and adapted to be operated by said type bars, a space key, and connections between said space key and said escapement mechanism comprising a lever extending above a part of said escapement mechanism and adapted to serve as a dust guard therefor.

28. In a typewriting machine, the combination of a carriage, a platen mounted on said carriage, a series of type bars adapted to strike said platen at a common printing point, a universal bar near said printing point, escapement mechanism for the carriage operated by said universal bar and comprising a dog rocker, and a spring arm mounted on said dog rocker and carrying said universal bar.

29. In a typewriting machine, the combination of a power driven carriage, an escapement member operatively connected thereto, and a key-actuated escapement member adapted to communicate motion to the first mentioned escapement in the direction of its feed movement.

30. In a typewriting machine, the combination with a main frame comprising a top plate and a carriage mounted above said top plate, of an auxiliary frame mounted beneath said top plate, a spring drum and a train of gearing connected with said spring drum mounted in said auxiliary frame and geared to said carriage, a bracket projecting from said auxiliary frame, a rotary tooth carrier mounted in said bracket and operated by said train of gearing, a dog rocker mounted on said bracket and having feed dogs coöperating with said tooth carrier, printing keys, and means operated by said keys for operating said dog rocker.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 7th day of December A. D. 1906.

ALEXANDER T. BROWN.

Witnesses:
J. B. Denyms,
E. M. Wells.