A. T. BROWN.

TYPE WRITING MACHINE.

APPLICATION FILED MAY 6, 1904.

907,730. Patented Dec. 29, 1908.

3 SHEETS—SHEET 1.

Fig. 1.

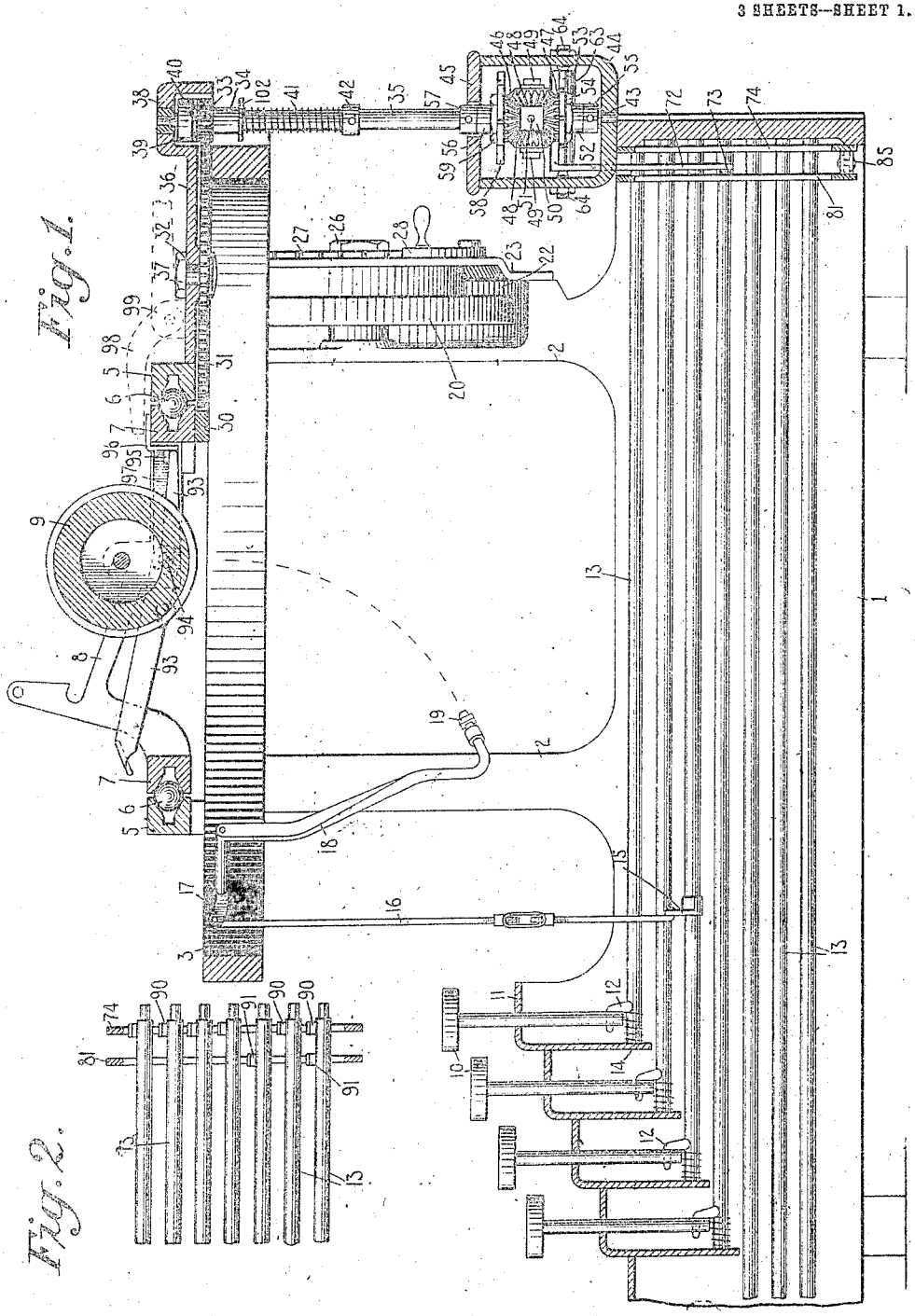


Fig. 2.

Witnesses.
E. M. Wells.
J. B. Reeves

Inventor
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Jacob Fabel

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3 SHEETS—SHEET 2.

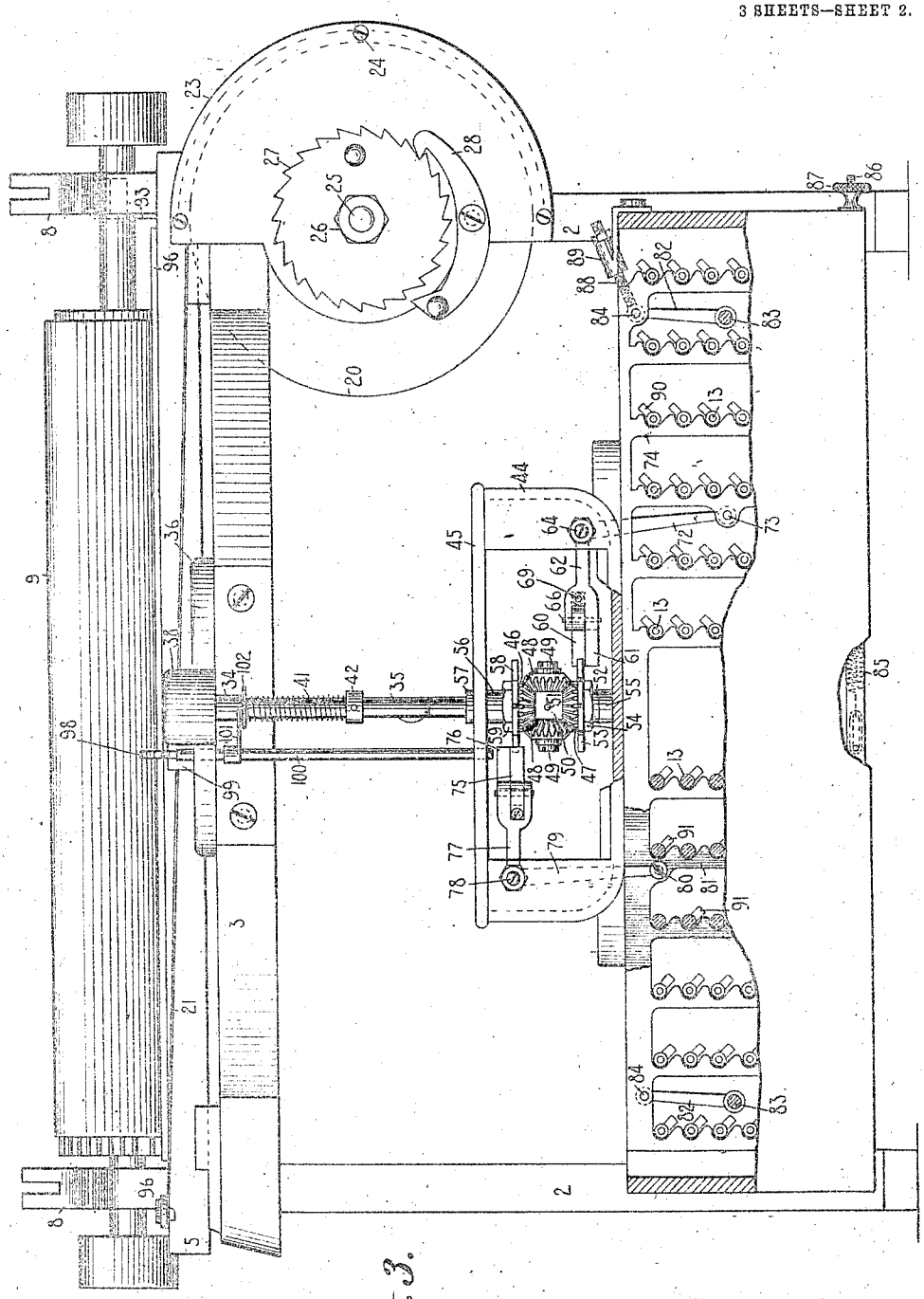


Fig. 3.

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3 SHEETS—SHEET 3.

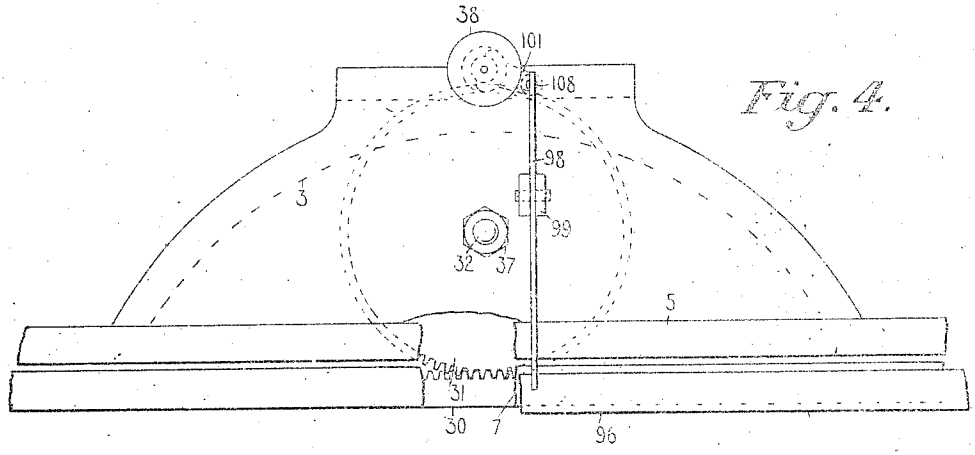


Fig. 4.

Fig 5.

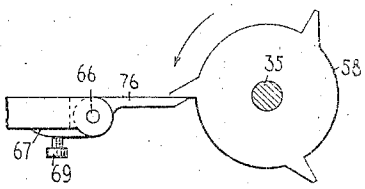


Fig. 6.

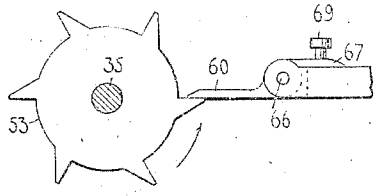


Fig. 7.

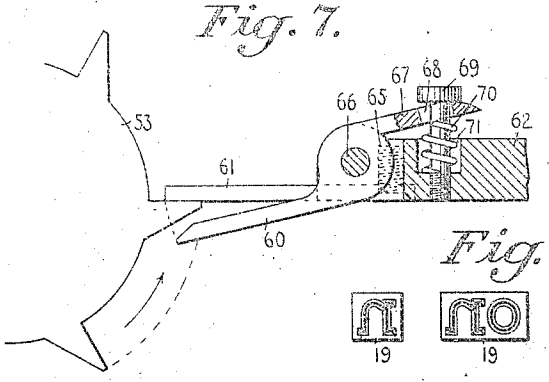


Fig. 8.

Witnesses

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Inventor

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UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

TYPE-WRITING MACHINE.

No. 907,730. Specification of Letters Patent. Patented Dec. 29, 1908.

Application filed May 6, 1904. Serial No. 206,661.

To all whom it may concern:

Be it known that I, ALEXANDER T. BROWN, a 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 more especially to the carriage feed mechanism of such machines.

According to the present invention some of the keys control a single type to print a single character, and other keys are adapted to print a plurality of characters. I have combined with such printing mechanism a plural key escapement mechanism whereby, upon the depression of any key, the carriage is fed a distance appropriate to the particular character or characters printed by such keys.

My invention will be understood by reference to the accompanying drawings in which,—

Figure 1 is a longitudinal sectional view of a typewriting machine. Fig. 2 is a detail view. Fig. 3 is a rear elevation. Fig. 4 is a plan view of a portion of the machine. Figs. 5 and 6 are top plan views of two escapement wheels with their coöperating dogs. Fig. 7 is a detail view of one of the escapements, and Fig. 8 illustrates different styles of type adapted for use in carrying out my invention.

I have shown my invention applied to a Smith Premier typewriter, but it will be obvious that most of the features thereof are applicable to any other style of typewriter. The main frame of the machine illustrated comprises a base 1 from which rise posts 2 which support a top ring 3, which, in turn, supports transverse rails 5. Said rails are grooved to receive balls or other antifriction devices 6 which together with the grooved rails 5 and the correspondingly grooved rails 7 of the carriage 8 constitute roller bearings for said carriage. The usual roller platen 9 is mounted on the carriage 8. Keys 10 have their stems guided in openings in plates 11 secured to or forming part of the main frame, and said key stems are pivotally connected at their lower ends to arms 12 projecting from rock shafts 13 which are journaled at their forward ends in said plates 11 and at their rear ends in the main frame. Springs 14 restore the rock shafts and keys to normal position. Each of said rock shafts has fixed thereto an arm 15 which is connected by a link 16 to an arm 17 which is connected to or forms part of a type bar 18 which carries at its free end a type 19. The construction is such that when any key 10 is depressed the corresponding type 19 is thrown upward against the platen. The carriage is drawn to the operator's left hand by a spring drum 20 which is connected to the carriage by a strap or band 21 (Fig. 3). The spring drum 20 is mounted on one of the posts 2 which is formed with or has secured thereto a segmental flange 22 (Fig. 1) to the rear face of which a plate 23 is secured by screws 24 (Fig. 3). These parts constitute a guard for the spring drum. The arbor 25 on which the spring drum is journaled extends from the post 2 through the plate 23 and carries on its outer end a nut 26. The tension of the spring may be regulated by a ratchet wheel 27, and a coöperating pawl 28 in the usual manner.

A rack bar 30 is secured to the rear rail 7 of the carriage and has rack teeth on the rear face thereof. This rack bar meshes with a horizontal gear wheel 31 which is journaled beneath the top plate on a stud 32 and in turn meshes with a pinion 33 which is integral with or is rigidly secured to a sleeve 34 loosely mounted on a vertical shaft 35. A housing 36 secured to the ring 3 covers the gear 31, the pinion 33 and the upper end of the shaft 35, and the stud 32 is here shown as a headed and shouldered bolt fixed to this housing by a nut 37. The housing 36 has a portion 38 in which the upper end of the shaft 35 is journaled and which is so formed as to cover the pinion 33 and the upper end of the shaft to serve as a guard for the same.

A collar 39 is fixed to the upper end of the shaft 35 above the pinion 33 and the lower side of said collar and the upper side of said pinion are formed with clutch teeth 40, each having one abrupt and one beveled face whereby the shaft and pinion are constrained to turn together in one direction but not in the other. The sleeve 34 is yieldingly held in its upper position by a compression spring 41 which surrounds the shaft 35 and presses at one end against the sleeve 34 and at the other end against a collar 42 fixed to the shaft.

The shaft 35 has its lower end 43 reduced as shown in Fig. 1 and journaled in a framework or housing 44 which is secured to the

base portion 1 of the main frame. The frame 44 comprises a base and upright portions as shown and has secured thereto a top plate 45, the whole constituting a housing for the escapement mechanism.

The escapement mechanism comprises a plurality of escapement wheels connected to one another and to the shaft 35 by epicycloidal gearing. Said train of epicycloidal gearing is in the present instance a beveled gear train and comprises two beveled gears 46 and 47 mounted on the shaft 35 and each meshing with one or more beveled gears 48 which are journaled on headed and shouldered screws 49, which are threaded into a block 50 which is mounted on the shaft 35. It being understood that the shaft 35, by reason of the spring drum 20, constantly tends to turn in the direction of the arrow in Fig. 3, it will be perceived that if either of the three elements of the epicycloidal train be fixed to the shaft 35 and an escapement be connected to each of the other two of said elements, then, if either escapement be operated, the shaft will be free to turn a distance determined by the design of that escapement, and if both escapements be operated at the same time the shaft will be free to turn a distance equal to the sum of distances determined by the two escapement mechanisms separately. In the present instance it is the middle element of the train, that is to say, the block 50 on which the orbitally movable gears 48 are mounted, that is fixed to the shaft 35, and escapement devices are connected to the two gears 46 and 47, these gears being loosely mounted on the shaft. In the present instance also the escapement wheels are secured directly to the gear wheels 46 and 47. The block 50 is secured to the shaft 35 by a pin 51 passing through said block and shaft. The beveled gear 47 has a hub 52 which is journaled on the shaft 35 and on which an escapement wheel 53 is rigidly secured by a nut 54 which is threaded onto the hub 52 and presses the escapement wheel against the gear wheel. Endwise movement of the hub 52 on the shaft 35 in one direction is prevented by the block 50 and in the other direction is prevented by a collar 55 secured to the shaft. The beveled gear 46 has a hub 56 journaled on the shaft 35 between the block 50 and a collar 57 secured to said shaft and an escapement wheel 58 is secured to said beveled gear and hub by a nut 59 in the same manner as the other escapement wheel. The parts being connected up in the manner which has been described, the escapement wheels 53 and 58 both tend to turn in the same direction. The motion of the escapement wheel 53 is controlled by a pair of dogs 60 and 61 mounted upon an arm 62 (Fig. 3) projecting from a rock shaft 63 (Fig. 1) mounted on pivot screws 64 threaded through the upright portions of the frame 44.

The detailed construction of the escapement dogs is illustrated in Fig. 7. The fixed dog 61 consists of an arm or plate of metal secured to the arm 62 by a screw 65 shown in Fig. 7 by dotted lines. The loose dog 60 is pivoted to the arm 62 by a pin 66 and said loose dog has a tail 67 through a slot 68 in which projects a headed screw 69 which is threaded into the arm 62. A compression spring 70 surrounds the screw 69 and is seated in a depression 71 in the arm 62 and tends to press the loose dog into the position shown in Fig. 7, the motion of the dog under the impulse of said spring being limited by the head of the screw. By securing the fixed dog to the arm 62 in the manner here shown and described I am enabled to make such dog of harder material than the arm 62. The shaft 63 is oscillated to operate the dogs 60 and 61 by an arm 72 which extends downward therefrom and is pivotally connected at 73 to a universal bar 74. The escapement wheel 58 is controlled by two dogs 75 and 76 mounted on an arm 77 projecting from a rock shaft which is supported by pivot screws 78 and which has depending therefrom an arm 79 which is pivotally connected at 80 to a second universal bar 81. The escapement dogs 75 and 76 and their connections are similar in all respects to those of the other set of dogs, except that, for convenience, the escapement dogs 75 and 76 are placed on the opposite side of the shaft 35 and for that reason the loose dog 75 is beneath the fixed dog 76, whereas the loose dog 60 stands above the fixed dog 61. The universal bars 74 and 81 are in the form of grids or gates substantially like those ordinarily used in the Smith Premier typewriter. They are arranged across the back of the machine parallel to each other and are supported for reciprocatory movement by arms 82 (Fig. 3) pivoted at 83 to the framework and at 84 to the universal bars. Said universal bars are drawn toward the right hand side of the machine by a spring or springs 85 connected at one end to each of the universal bars and at the other end to a rod 86 in which is threaded a milled nut 87 whereby the tension of the springs may be regulated. The motion of each of the spring 85 is adjustably limited by a screw 88 threaded through a bracket 89 secured to the main frame and at its end engaging a portion of the universal bar. As here shown the screw 88 engages the free end of one of the arms 82. The universal bar 74 is operated by short arms 90 and the universal bar 81 by similar short arms 91 projecting from the several rock shafts 13 in the usual manner. The relation of the dogs to the escapement wheel and of the universal bar to the arms 90 and 91 may be regulated by adjusting the screws 88. It will be understood, of course, that the es-

escapement device, or by any other sort of plural feed device to which said carriage is connected by a bevel gear epicycloidal train. It is also broadly new to impart feed movements to a typewriter carriage by a plurality of feed devices of any character whatever, said feed devices having different feed values when operated singly, and having, when operated together, a feed value equal to the sum of the feed values of said devices when operated singly.

A plural escapement mechanism for controlling the carriage feed of a typewriting machine, is not claimed broadly in this application, however, as that invention is so claimed in my Patent No. 779,407, dated January 10th, 1905.

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

1. In a typewriting machine, the combination of a carriage, a plurality of separately operable escapements for controlling the movement of said carriage in one direction; and connections between said carriage and said plural escapements, said connections including means to permit the carriage to be moved independently of either of said escapements in one direction but not in the other.

2. In a typewriting machine, the combination of a carriage, a plurality of separately operable escapements for controlling the movement of said carriage in one direction; connections between said carriage and said plural escapements, said connections being normally adapted to permit the carriage to be moved independently of said plural escapements in one direction but not in the other; and a carriage release device for breaking said connections so as to permit the carriage to be moved independently of either of said escapements in either direction.

3. In a typewriting machine, the combination of a carriage, a plurality of separately operable escapements for controlling the feed of said carriage; and connections including a clutch between said plural escapements and said carriage.

4. In a typewriting machine, the combination of a carriage; a plurality of separately operable escapements for controlling the feed of said carriage; and a carriage release device for breaking the connections between said carriage and all of said escapements.

5. In a typewriting machine, the combination with the series of character keys, the key-controlled printing means and the carriage, of a plurality of escapements for controlling the feed of said carriage, and a plurality of universal bars controlled by said character keys and controlling said escapements.

6. In a typewriting machine, the combination with the series of character keys, the key-controlled printing means and the carriage, of a plurality of escapements for controlling the feed of said carriage, one of said escapements being adapted to afford a greater extent of feed than another; and a plurality of universal bars controlled by said character keys and controlling said escapements.

7. In a typewriting machine, the combination with the series of character keys, the key-controlled printing means and the carriage, of a plurality of separately operable escapements for controlling the feed of said carriage, and means whereby some of said character keys control one of said escapements and other of said character keys control another of said escapements.

8. In a typewriting machine, the combination with the series of character keys, the key-controlled printing means and the carriage, of a plurality of escapements for controlling the feed of said carriage, and means whereby some of said character keys control one of said escapements, other of said character keys control another of said escapements, and other of said character keys control a plurality of escapements.

9. In a typewriting machine, the combination with the series of keys, the key controlled printing means and the carriage, of a plurality of escapements for controlling the feed of said carriage, one of said escapements being adapted to afford a greater extent of feed than another; and means whereby some of said keys control one of said escapements and some another and some a plurality of escapements.

10. In a typewriting machine, the combination with the series of keys, the key controlled printing means and the carriage, of a plurality of universal bars, one of said universal bars being controlled by certain of said keys, another of said universal bars being controlled by other of said keys, and a plurality of said universal bars being controlled by still other of the keys; and carriage feed devices controlled by said universal bars.

11. In a typewriting machine, the combination with the carriage of a plurality of separately operable step-by-step devices for said carriage, one of said step-by-step devices being adapted to afford a single letter-space feed to said carriage and another of said step-by-step devices being adapted to afford a multiple letter-space feed to said carriage; and means for operating either of said step-by-step devices.

12. In a typewriting machine, the combination with the carriage, of a plurality of step-by-step devices for said carriage, one of said step-by-step devices being adapted to afford a greater feed movement than another; and means for operating either of said step-by-step devices singly or for operating a plurality of them simultaneously.

13. In a typewriting machine, the com-

bination with the carriage, of two separately operable step-by-step devices for said carriage, one of said step-by-step devices when operated alone being adapted to afford a single letter-space feed to the carriage, the other one when operated alone being adapted to afford a double letter-space feed to the carriage, and the two when operated together being adapted to afford a triple letter-space feed to the carriage.

14. In a typewriting machine, the combination with printing instrumentalities of keys, each adapted to print a single character; a universal bar controlled by said keys; keys, each adapted to print two characters; a second universal bar controlled by said keys; other keys, each adapted to print three characters and to control both universal bars; a carriage; and means whereby the first universal bar affords a single letter-space feed to said carriage, the second universal bar affords a double letter-space feed to the carriage, and the two universal bars when operated together afford a triple letter-space feed to the carriage.

15. In a typewriting machine, the combination with the carriage, of a plurality of step-by-step devices, and connections between said step-by-step devices and said carriage, said connections including a bevel-gear epicycloidal train.

16. In a typewriting machine, the combination with the carriage, of a shaft; an orbitally movable gear having its bearing fixed to said shaft; two rotary gears loose on said shaft and each meshing with said orbitally movable gear; two escapements, one controlling each of said rotary gears; and means connecting said shaft to said carriage.

17. In a typewriting machine, the combination with the carriage, of an epicycloidal train comprising three elements, one of said elements being an orbitally movable member having a gear journaled thereto and the other two elements being rotary gears; two escapements controlling two of said elements respectively; a shaft to which the remaining element is fixed and on which the escapement controlled elements are journaled; and means whereby said shaft controls said carriage.

18. In a typewriting machine, the combination with the carriage, of a shaft for controlling the feed of said carriage; an orbitally movable gear having its bearing fixed to said shaft; two rotary gears journaled on said shaft on opposite sides of said bearing and meshing with said orbitally movable gear, each of said rotary gears having an escapement wheel fixedly connected thereto; and feed dogs coöperating with said escapement wheels.

19. In a typewriting machine, the combination with the carriage, of a plurality of escapements, and character keys arranged to operate said escapements to feed the carriage different distances.

20. In a typewriting machine, the combination with the carriage, of a plurality of feed devices for said carriage, said feed devices having different feed values; and means whereby, when any of said feed devices is operated alone, the carriage is fed a distance equal to the feed value of the particular feed device operated, and when more than one of said feed devices are operated, the carriage is fed a distance equal to the sum of the feed values of the feed devices operated.

21. In an escapement mechanism, the combination of a pivotally mounted arm; a fixed dog secured to said pivoted arm; a loose dog pivoted to said arm and having a backwardly extending tail; a spring seated in a depression in said pivoted arm beneath said tail; a headed post extending through an opening in said tail and limiting the motion of said loose dog under the impulse of said spring; and a ratchet coöperating with said dogs.

22. In a typewriting machine, the combination with the carriage, of a series of keys; a horizontally reciprocating universal bar; a bell-crank lever, a vertically disposed arm of which is connected directly to said universal bar and a horizontally disposed arm of which carries feed dogs; and a horizontally disposed ratchet wheel controlled by said feed dogs and controlling said carriage.

23. In a typewriting machine, the combination with the carriage, of a vertical shaft geared to said carriage; a plurality of escapement wheels mounted on said shaft, one above another; separate sets of feed dogs coöperating with each of said escapement wheels; and means for operating said feed dogs.

24. In a typewriting machine, the combination with the carriage, of a shaft geared to said carriage; a plurality of escapement wheels mounted on said shaft; and a plurality of sets of escapement dogs arranged on different sides of said shaft and coöperating with said escapement wheels.

25. The combination of an epicycloidal gear train comprising two beveled gears mounted to rotate about the same axis, a planetary beveled gear in mesh with said two gears and mounted for planetary motion about said axis; and rotary devices connected with said two beveled gears and said planetary gear.

Signed at Syracuse, in the county of Onondaga and State of New York this 30th day of April A. D. 1904.

ALEXANDER T. BROWN.

Witnesses:
C. E. TOMLINSON,
GEO. C. CARHART.