A. T. BROWN.

TYPE WRITING MACHINE.

APPLICATION FILED JUNE 29, 1904.

911,198.

Patented Feb. 2, 1909.

3 SHEETS—SHEET 1.

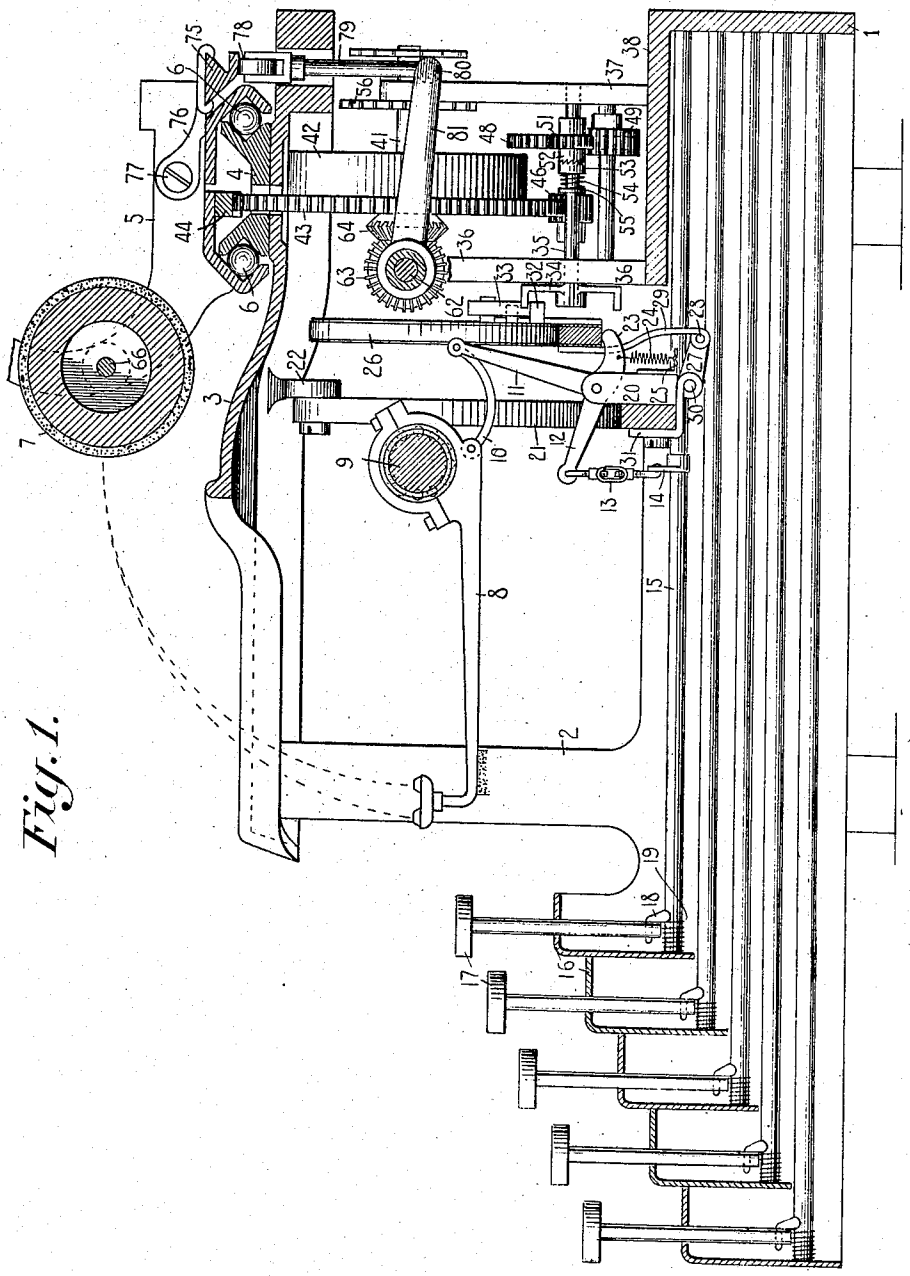

Fig. 1.

Witnesses
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M. L. Hammacher

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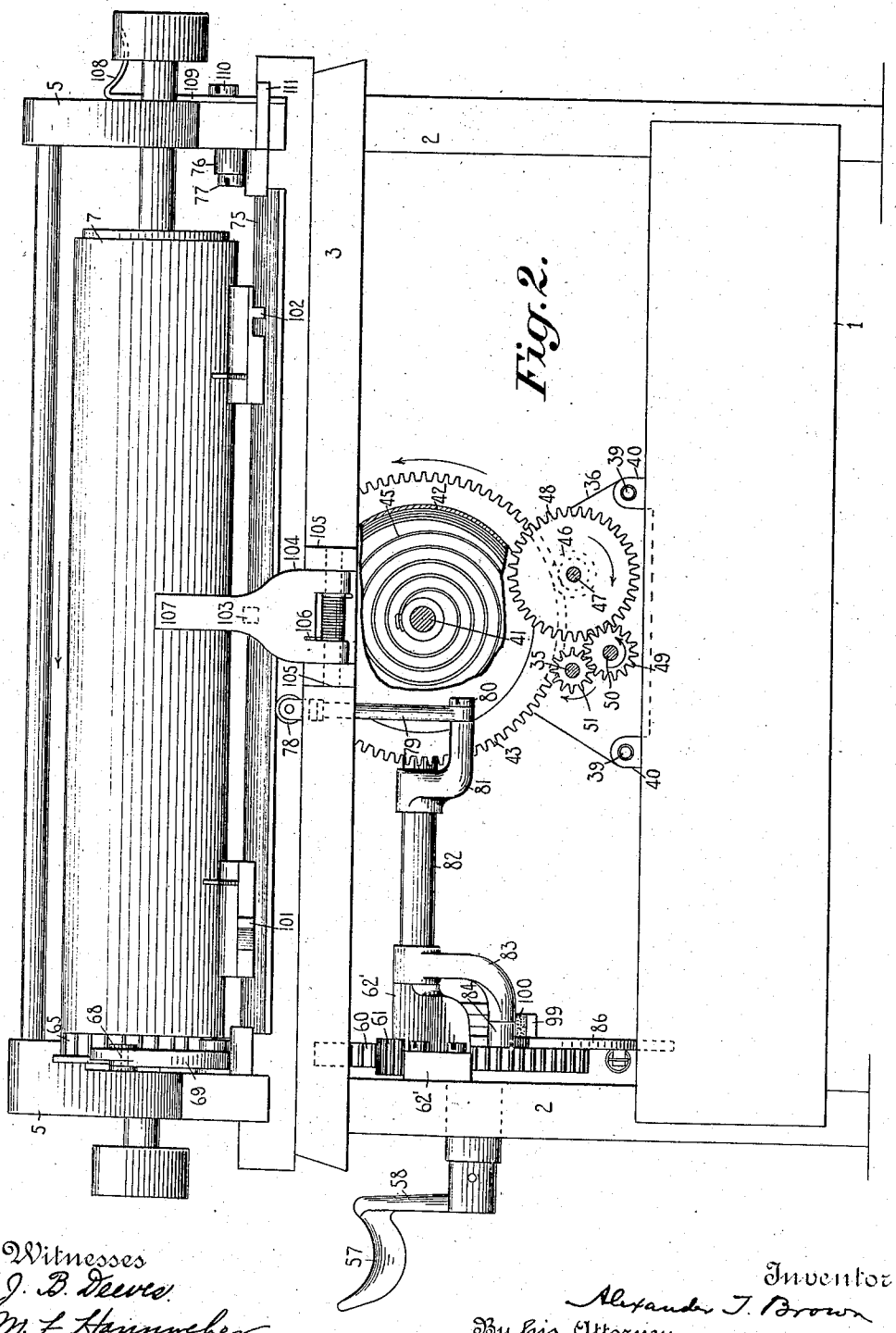

Fig. 2.

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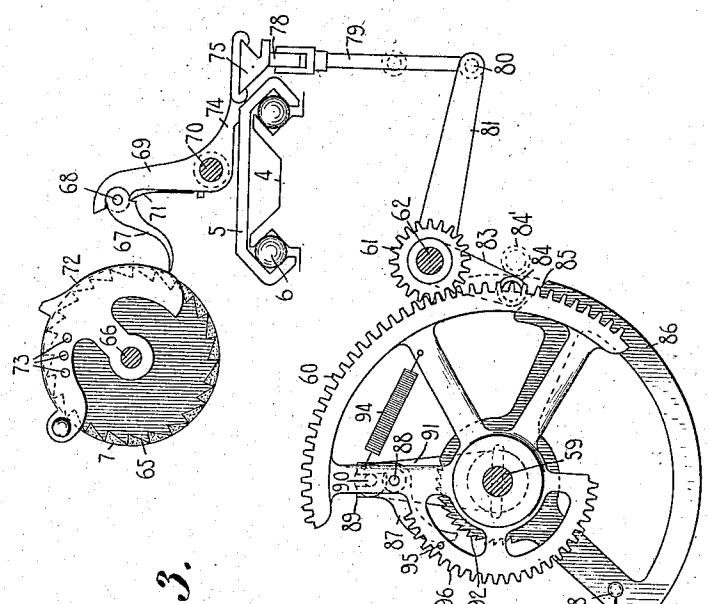

Fig. 3.

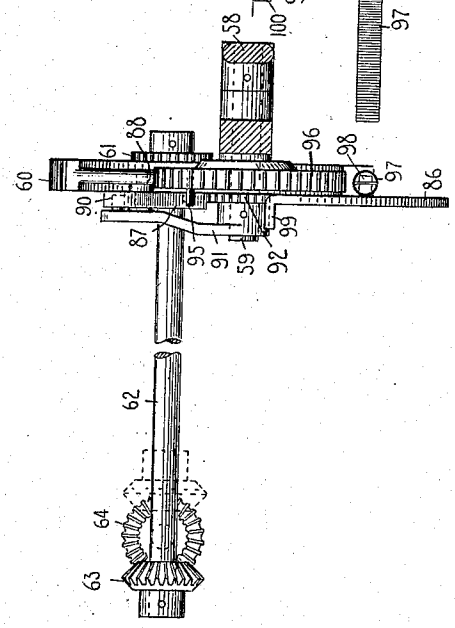

Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

TYPE-WRITING MACHINE.

No. 911,198. Specification of Letters Patent. Patented Feb. 2, 1909.

Application filed June 29, 1904. Serial No. 214,624.

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 feeding and returning devices and the line space mechanism of such machines.

One of the objects of my invention is to provide a typewriting machine, the carriage feeding and returning mechanism of which may be readily geared up for use in writing either a language such as English, which is written from left to right, or a language such as Arabic, which is written from right to left, without requiring any changes in the framework, and requiring a minimum change in the mechanism, to adapt the machine to one language or another.

Another object of my invention is to provide a line space mechanism which is operated by a carriage returning mechanism which is mounted on the main frame.

One embodiment of my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view of a typewriting machine, the section being taken from front to rear thereof; Fig. 2 is a rear elevation of said machine; Fig. 3 is a diagrammatic view in end elevation of the carriage returning and line space mechanism; and Fig. 4 is a front view of a portion of the same.

I have shown my invention applied to a front-strike typewriter, the main frame of which comprises a base portion 1, from which rise posts 2 which support a top plate 3 on which is mounted a rail 4 having raceways in its front and rear edges which cooperate with corresponding race-ways in the carriage 5, which is supported by anti-friction balls or rollers 6 which run in said raceways. The platen 7 is mounted in the carriage, and types mounted on the upwardly and rearwardly striking type bars 8, strike against the front face of said platen. Said type bars are pivotally mounted on a segment 9 and are actuated by links 10 pivoted at one end to the type bars and at the other end to the upwardly extending arms 11 of bell crank sub-levers, the forwardly extending arms 12 of which are connected by links 13 to arms 14 mounted on rock shafts 15 which are journaled at their rear ends in the base portion 1 of the main frame and at their forward ends in frame plates 16. Said rock shafts are actuated by keys 17, the stems of which are pivoted to arms 18 on the rock shafts 15, and said rock shafts are returned to normal position by springs 19 in a manner well known in the art. The bell cranks 11, 12 are pivotally mounted in hangers 20 mounted on a fixed segment 21, which is supported by ears or brackets 22 depending from the top plate 3. Each of said sub-levers has a rearwardly extending arm 23 to which is connected one end of a returning spring 24, the other end of which is connected to a bracket 25. The rearwardly extending arms 23 lie beneath a stepped segmental universal bar 26, which is mounted for parallel vertical motion.

A link 27 is pivoted at 28 to the lower end of a bracket 29 depending from said universal bar, and at 30 to a fixed bracket 31 which is secured to the fixed segment 21. The universal bar is supported at its upper end by arms fixed on a transverse rock shaft, said arms lying parallel to the link 27. These parts are not shown as they are not claimed herein. A fixed dog 32 and a loose dog 33 mounted on the rear face of the universal bar, control an escapement wheel 34 which is fixed on a shaft 35, which is geared to the carriage.

When one of the keys is depressed the arm 23 of the corresponding sub-lever is elevated and said arm elevates the universal bar 26. The motion of said universal bar is guided by the arms extending from the rock shaft above referred to, and the lower middle part of the universal bar is guided in said motion by the link 27. A tooth of the escapement wheel normally contacts with the loose dog 33 but when the universal bar rises the fixed dog 32 moves into the path of said tooth and the loose dog is thrown forward by a spring (not shown) so that when the universal bar returns to normal position the escapement wheel tooth is behind said loose dog. The tooth is thus freed from the dogs and the wheel turns until the next tooth strikes the loose dog and moves it over to its normal position in contact with a stop which arrests it in said normal position. This operation is

repeated at each succeeding key operation. These parts have not been fully shown nor described herein because they are not claimed herein. Said parts are fully shown and described and are claimed in another application of mine, Serial No. 229,485, filed October 21st, 1904. Said application No. 229,485 is a division of a prior application of mine, Serial No. 214,625, filed June 29th, 1904. Some of the features claimed in the present application are claimed more broadly in said application Serial No. 214,625. The carriage and carriage mounting set forth in the present case is also claimed in said application Serial No. 214,625. The ball bearing type bar and the connections between said type bar and the keys as shown herein are claimed in my application Serial No. 201,260, filed April 2nd, 1904.

The top plate 3 projects forward of the front face of the platen and serves as a dust guard to prevent the dirt of erasures made on the platen from falling into the pivotal bearings of the type bars. This feature is not claimed herein, but is claimed in my said application Serial No. 201,260.

The shaft 35 is journaled near its ends in two frame plates 36 and 37 which are mounted on the back shelf 38 of the main frame to which they are secured by screws 39 (Fig. 2) threaded into lugs 40 rising from said shelf. A shaft 41 is journaled in the frame pieces 36 and 37, and on this shaft is journaled a spring drum 42 and a gear wheel 43 which is rigidly connected to said spring drum and which meshes with a feed rack 44 fixed to the underside of the carriage 5, said gear extending through a slot in the top plate 3 and the rail 4. A driving spring 45 is connected at its inner end to the shaft 41 and at its outer end to the drum 42. The gear wheel 43 meshes with a pinion 46 which is fixed on a shaft 47 (Fig. 2), which is journaled in the frame pieces 36 and 37. As shown, a gear wheel 48, also fixed on the shaft 47, meshes with an idle gear 49 on a shaft 50, which is journaled in the frame plates 36 and 37, and said idle gear meshes with a pinion 51 which is loosely mounted on the shaft 35 of the escapement wheel. The hub 52 of the pinion 51 (Fig. 1) is formed with ratchet teeth which engage corresponding teeth on a sleeve 53 which is splined on the shaft 35, and which is pressed toward the hub 52 by a spring 54 which is coiled about the shaft 35 and compressed between said sleeve and a collar 55 fixed on said shaft. The construction is such that the pinion 51 is free to turn on the shaft 35 in one direction but not in the other. The shaft 41 has fixed thereon a ratchet wheel 56 which is engaged by a retaining pawl and by which the tension of the spring 45 is controlled in a manner well known in the art.

The carriage is returned to begin a new line by a handle 57 on the end of a lever 58 which is fixed on the outer end of a shaft 59 which is journaled in the main frame of the machine. A segmental gear 60 is loosely mounted on the shaft 59 and meshes with a pinion 61 which is fixed on a shaft 62, which is journaled at one end in a bracket 62′ projecting from the main frame and at the other end in the frame piece 36. Near its inner end the shaft 62 has rigidly mounted thereon a beveled gear 63 which meshes with a beveled gear 64, which is rigidly connected with the gear wheel 43 and spring drum 42. The construction is such that if the handle 57 be depressed the shaft 62 will be turned toward the back of the machine and the gear wheel 43 will be turned and the carriage will be moved across the machine.

The machine is shown in the drawings geared up to write such a language as Arabic. The feeding mechanism is adapted to feed the carriage from left to right as indicated by the arrows in Fig. 2, and the returning mechanism is geared up to move the carriage from right to left. In order to gear the machine up to write such a language as English, the spring 45 would be disconnected from its hooks and turned around so as to exert its tension in the other direction and the ratchet wheel 56 and its pawl would be correspondingly reversed; the idle pinion 49 would be removed from the machine, or, at least, moved out of gear, and the gear wheel 48 and pinion 51 would be replaced by wheels of larger size so that they would mesh with each other. The spring would then tend to drive the carriage from right to left, but the escapement wheel and its shaft 35 would still turn in the same direction as that indicated in Fig. 2. The carriage returning mechanism would be reversed by turning the beveled gear 63 around and moving it to the position shown in dotted lines in Fig. 3, that is to say, it would be moved to the other side of the center of motion of the beveled gear 64. It will thus be seen that the driving spring is reversible, that the gear which connects said spring with the escapement wheel is changeable, and that the returning lever is connected to the carriage by gearing, one member of which is changeable. It will also be perceived that this change in the gearing does not require any change in the castings of the machine, nor the use of any new parts, except the gear 48 and pinion 51. Ordinarily, of course, in the manufacture of these machines, each machine would be geared up when first assembled to suit the particular language which that machine was designed to write; but the gearing of any machine could be changed at any time from one style to the other. In substituting other wheels for the wheels 51 and 48, the ve-

locity ratio of the two wheels may be changed or not as desired according as it is desired to use the same width of spacing or not.

For the purpose of imparting line space feed to the platen 7, said platen has on one end thereof a ratchet wheel 65 and said platen has a shaft 66 which is journaled in the end pieces of the carriage 5. The ratchet wheel 65 is operated by a pawl 67 which is pivoted at 68 to an upwardly extending arm 69 of a lever which is pivoted at 70 to one of the end pieces of the carriage. The pawl 67 is pressed toward the ratchet wheel 65 by a spring 71 fixed to the arm 69 and engaging the heel of the pawl. The extent of motion imparted to said ratchet wheel by said pawl is regulated by adjusting a guard plate 72, which is pivoted on the shaft 66 and which is adjustable to any one of several positions in which it is yieldingly held by a spring pin, the conical end of which enters openings or depressions 73 in said guard plate.

The pawl 67 normally rests on the periphery of the guard plate 72 and said pawl has a uniform extent of motion more than sufficient if the entire extent of such motion were utilized to turn the ratchet wheel 67 a distance of three teeth. Said ratchet wheel is turned through this distance at each operation of said pawl when the guard plate 72 is set in its extreme forward position with the spring pin engaging the rearmost one of the three depressions 73. When said guard plate is moved back to a point where said pin engages the middle one of said depressions 73, the pawl is held out of engagement with the ratchet wheel by the guard plate until the first ratchet tooth with which said pawl would otherwise engage has been passed, but moves off the end of the guard plate and into engagement with the ratchet wheel in time to move said wheel a distance of two teeth. When the guard plate is moved still further toward the back of the machine until the spring pin engages the forward one of the three depressions 73, the guard plate holds the pawl out of engagement with the wheel through a space of two teeth, thus permitting said wheel to be turned through a distance of only one tooth by said pawl.

The lever 69 has a rearwardly extending arm 74 upon which is mounted one end of a yoke bar 75 which extends lengthwise of the carriage and at its other end is rigidly connected with an arm 76 which is pivoted at 77 to the other end piece of the platen frame. The arms 74 and 76 and the bar 75 together constitute a yoke frame. This frame is raised to operate the pawl 67 to impart a line feed to the platen by a roller 78 mounted in the upper end of a rod 79, the lower end of which is pivoted at 80 to an arm 81 which extends toward the back of the machine from a sleeve 82 which is journaled on the shaft 62. An arm 83 of the sleeve 82 has an anti-friction roller 84 journaled thereon and said roller lies in position to be engaged by the cam end 85 of a segment 86, which is loosely mounted on the shaft 59 by the side of the gear segment 60. Said gear segment is not rigidly mounted on the shaft 59, but is loose thereon, and has a pawl 87 pivoted thereto at 88. Said pawl has an upwardly extending forked arm 89, and into the fork of said arm extends a pin 90 which projects from an arm 91, the hub of which is fixed on the shaft 59. The segment 86 has a ratchet toothed portion 92 (Fig. 3) which is in position to be engaged by the pawl 87, but this pawl is normally held out of engagement with said ratchet by a spring 94 which is connected at one end to the gear segment 60 and at the other end to said pawl. The motion of the pawl under the impulse of the spring 94 is limited by a stop pin 95 which projects from a toothed portion 96 of the gear segment 60. The toothed segment 96 operates the ribbon mechanism which is not shown herein.

The segment 86 is held in its normal position, shown in the drawings, by a spring 97, which is connected at one end to the main frame and at the other end to a pin 98 projecting from said segment. Said segment is bent as shown in Fig. 4 at 99, and this bent end normally engages a stop cushion 100 of felt or other sound deadening material. The construction is such that when the returning handle 57 is depressed, the pin 90 is moved toward the front of the machine and presses the pawl 87 into engagement with the ratchet 92 against the tension of the spring 94. The segment 86 and the gear segment 60 are then moved by said handle, the gear segment 60 returning the carriage in the manner which has been described. The cam portion 85 of the segment 86 moves the roller 84 to the dotted line position 84′ (Fig. 3), which raises the arm 81, the rod 79 and the yoke bar 75 and operates the pawl 67 and thus imparts the line space feed to the platen. When the handle is released, the spring 94 moves the pawl 87 out of engagement with the ratchet 92, the spring 97 restores the segment 86 to normal position and the arms 83 and 81 and the parts connected thereto drop back to normal position. The gear segment 60 does not return to the normal position at this time but the position of said segment is controlled at all times by the position of the carriage.

It will be perceived that the line feed will be imparted to the platen during the first part of the motion of the handle, in whatever position in the line of writing the carriage may be at the time.

The bar 75 has a margin stop 101 and a line stop 102 adjustably mounted thereon,

and these stops are in position to engage a lug 103 which projects toward the front of the machine from an arm 104, which is pivoted in brackets 105 projecting from the main frame. The arm 104 is held in normal position by a spring 106 but may be pressed toward the back of the machine against the tension of said spring in order to permit the stops to pass the lug 103. When the carriage is returned to initial position by the handle, the bar 75 occupies an elevated position in which the margin stop 101 is adapted to engage the upper end 107 of the arm 104. The stops 101 and 102 may be readily changed in case the machine is changed from one language to another.

The bar 75 may be raised sufficiently to cause the stops 101 and 102 to pass above the lug 103 but not sufficiently to impart a feed movement to the platen by a release key 108 (Fig. 2) formed on the end of a lever 109 which is pivoted at 110 to one of the end pieces of the carriage and the rear end of which lies beneath an arm 111 which projects from the bar 75.

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

1. In a typewriting machine, the combination of a carriage; a reversible spring for driving said carriage; an escapement; changeable gearing connecting said escapement and carriage; a carriage-returning lever on the main frame; and gearing connecting said lever and said carriage, said gearing having a member shiftable to reverse the direction of power transmission.

2. In a typewriting machine, the combination of a carriage; a reversible driving spring geared to said carriage; an escapement; changeable gearing connecting the escapement and carriage; and a carriage returning lever connected to the carriage by gearing having a member shiftable to opposite sides of another member of said gearing to reverse the direction of power transmission.

3. In a typewriting machine, the combination of a carriage; a hand lever fulcrumed on the frame and provided with a wrist or crank pin; a segmental gear; a pawl pivoted to said segmental gear and engaging said crank pin; a ratchet and cam segment actuated by said pawl; line feed mechanism actuated by said cam segment; and carriage moving gearing actuated by said segmental gear.

4. In a typewriting machine, the combination of a carriage, a hand lever fulcrumed on the frame and provided with a crank pin; a segmental gear; a pawl pivoted to said segmental gear and engaged by said crank pin; a cam segment concentric with said segmental gear; a ratchet connected to said cam segment and actuated by said pawl; a pinion meshing with said segmental gear and fixed on a shaft which is geared to the carriage; an arm journaled on said shaft and controlled by said cam segment; and a line space device controlled by said arm.

5. In a typewriting machine, the combination of a carriage; a hand lever fulcrumed on the main frame and provided with a crank pin; a segmental gear geared to said carriage; a pawl pivoted to said segmental gear and engaged by said crank pin; a cam segment concentric with said segmental gear; a ratchet connected to said cam segment and actuated by said pawl; a line space device actuated by said cam; and means for returning said cam to normal position when said hand lever is released.

6. In a typewriting machine, the combination of a carriage; a gear which is geared to said carriage to return the same; a pawl pivoted to said gear; a ratchet operated by said pawl; a spring which normally holds said pawl out of engagement with said ratchet; means for moving said pawl into engagement with said ratchet and operating said ratchet and said gear; and a line-space device operated by said ratchet.

7. In a typewriting machine, the combination with the carriage and platen, of means for imparting a step by-step feed to said carriage, said means being changeable so as to feed the carriage in either direction; a carriage returning device which is changeable to move the carriage in either direction; and a line-feed device operated by said carriage returning device.

8. In a typewriting machine, the combination with the carriage and platen, of feed devices for said carriage, said feed devices being changeable to feed said carriage in either direction; a carriage returning device mounted on the main frame and changeable to move the carriage in either direction; and a line feed device operated by said carriage returning device.

9. In a typewriting machine, the combination with the carriage and platen, of means for imparting a step-by-step feed to said carriage, said means being changeable so as to feed the carriage in either direction; a carriage returning device mounted in the machine and changeable to move the carriage in either direction; and a line-feed device operated by said carriage returning device.

10. In a typewriting machine, the combination with the carriage and platen, of a handle and connections mounted in the machine for moving said carriage, said connections being changeable to move the carriage in either direction; and a line feed device operated by said handle whether said connections be set to move the carriage one way or the other.

11. In a typewriting machine, the combination with the carriage and platen, of means mounted in the machine for moving

said carriage across the machine, said means being changeable to move the carriage in either direction; and a line-feed device operated by said means whether said connections be set to move the carriage one way or the other.

12. In a typewriting machine, the combination of a carriage, a platen mounted on said carriage, step-by-step feed devices for said carriage, a hand actuated lever and connections for returning said carriage, a segment movably mounted co-axially with said lever, means operated by said segment for imparting a line-space feed to said platen, and means for automatically connecting said segment with said lever when the latter is operated and disconnecting it from said lever when the latter is released.

Signed at Syracuse, in the county of Onondaga, and State of New York this twenty-seventh day of June A. D. 1904.

ALEXANDER T. BROWN.

Witnesses:
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A. L. HINMAN.