

Aug. 13, 1929.

F. B. POWERS

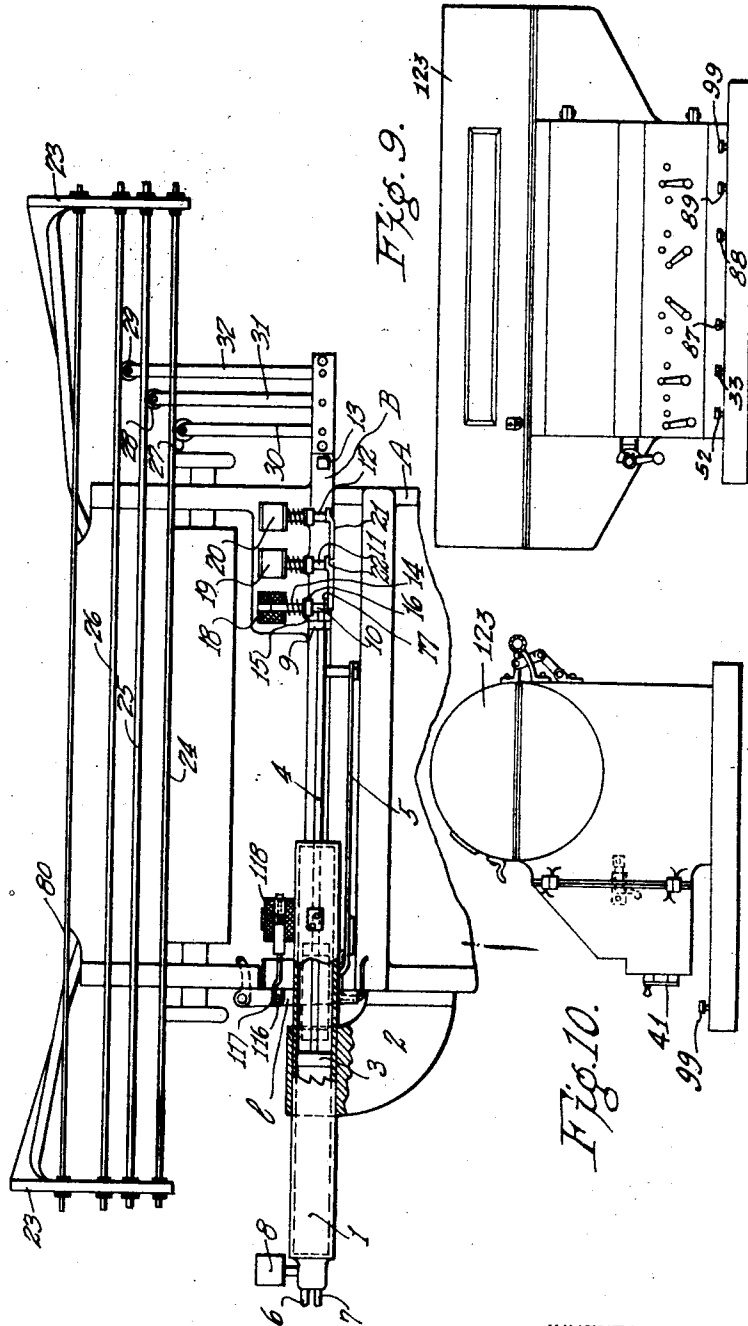
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LINE SPACING MECHANISM FOR TYPEWRITERS

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4 Sheets-Sheet 1

Fig. 1.



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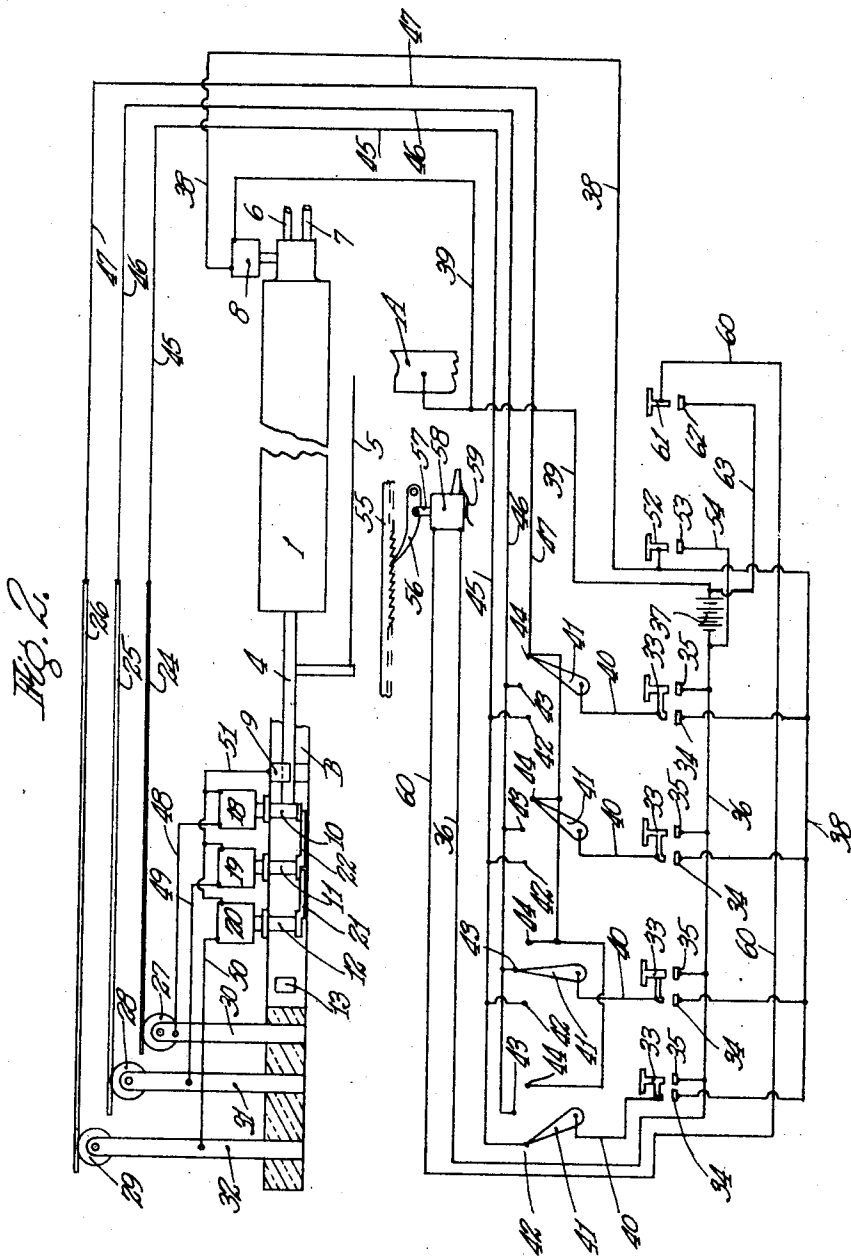
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LINE SPACING MECHANISM FOR TYPEWRITERS

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4 Sheets-Sheet 2



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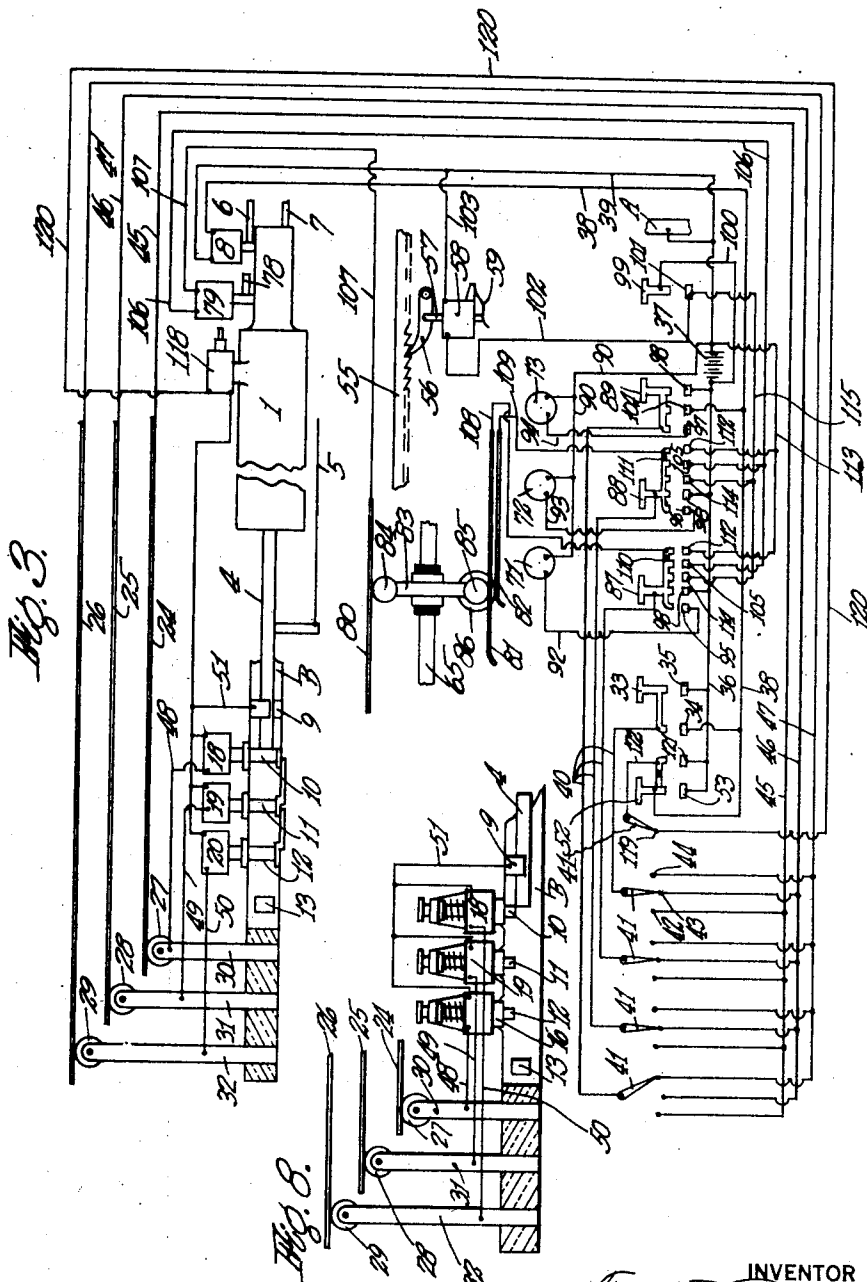
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LINE SPACING MECHANISM FOR TYPEWRITERS

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4 Sheets-Sheet 3



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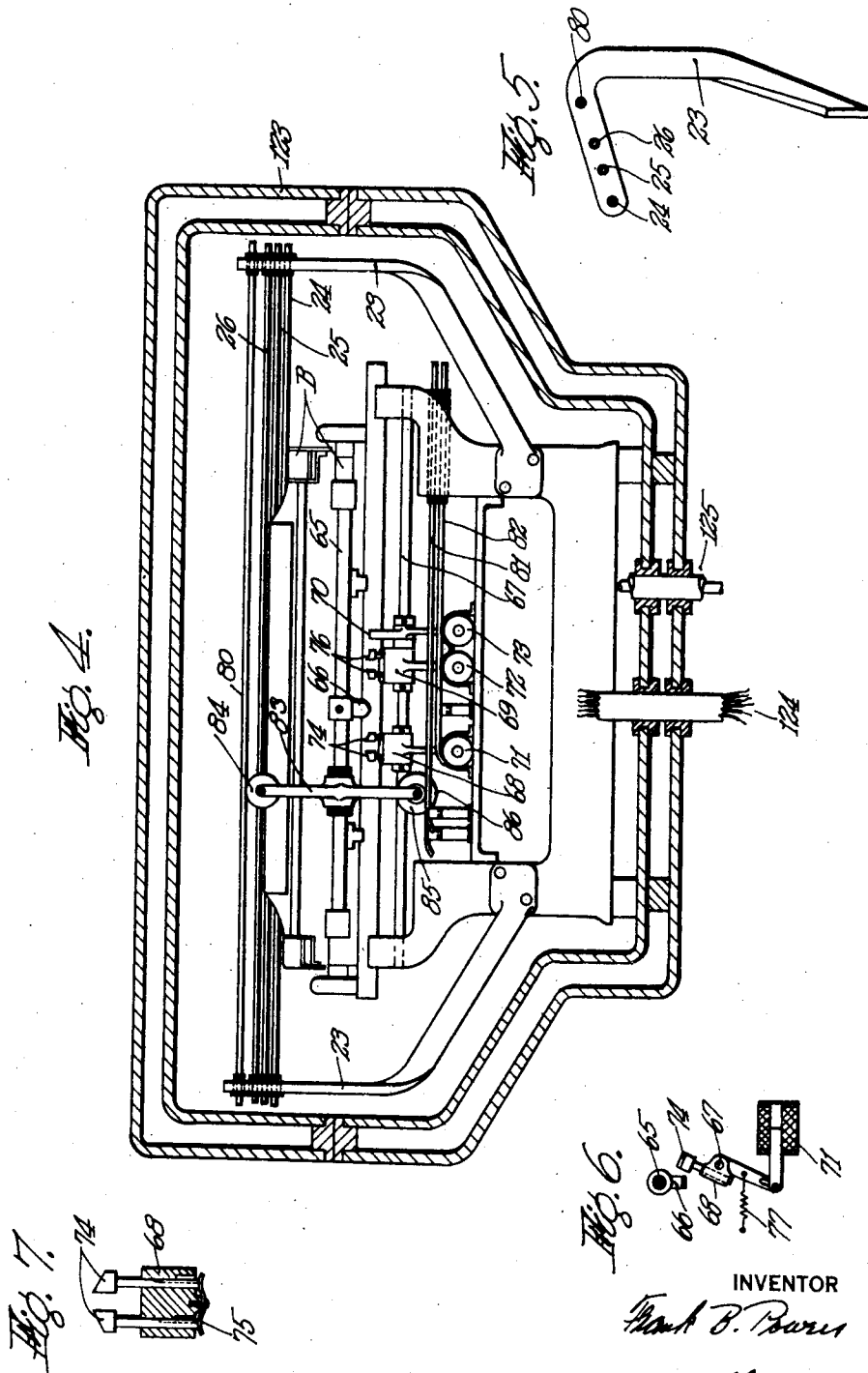
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LINE SPACING MECHANISM FOR TYPEWRITERS

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE.

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LINE-SPACING MECHANISM FOR TYPEWRITERS.

Application filed June 23, 1924. Serial No. 721,906.

This invention relates generally to typewriters and more particularly, to improvements therein relating to the control and operation of the line spacing mechanism and to the control and operation of the carriage.

The improvements of this invention may be used for various purposes and, as an illustrative example, they are especially suitable for typewriters which are intended for commercial correspondence. The modern business letter differs distinctively from the style of letters formerly used. The old style letter had but few paragraphs and all the lines of the letter were uniformly spaced. A practice, now frequently in vogue, is to use a relatively large number of short paragraphs, the lines in which are uniformly spaced, and to prominently set out the paragraphs from one another by a wider space therebetween. Similarly, the line for the complimentary closing is set off from the last paragraph and the signature line is set off from the line for the complimentary closing by the same spacing as is used between paragraphs. Furthermore, the body of the letter, the initial line of each paragraph, the line for the complimentary closing, and the signature line are indented from the margin of the paper to varying degrees, increasing in the order named. The style of letter described is given merely as a representative type and the point is that, in the present times, distinctiveness in commercial correspondence is desired and the improvements of this invention are calculated to facilitate the work of the typist in writing letters of the general type described.

An object of this invention is to provide in a typewriter, improved controlling means for the line spacing mechanism, whereby the desired variations in line spacing may be conveniently effected.

Another object of the invention is to provide, in a typewriter, a plurality of controlling means for the line spacing mechanism, any one of which means is operable independently of the other and may effect different line spacing movements.

Another object of the invention is to provide, in connection with the controlling means described, mechanism whereby each of such means is adjustable and may be set to effect various degrees of line spacing movement.

Another object of the invention is to pro-

vide in a typewriter, improved means for controlling the movement of the carriage, whereby it may be conveniently brought to various predetermined positions to effect the desired variations in line indentation.

The features of the invention relating to line spacing and line indentation are each capable of use independently of the other although for the purpose described they are desirably used in conjunction.

Another object of this invention is to meet the demand for noiseless operation. The stopping of the carriage and the line spacing of its platen are usually noisier than are all other parts of a typewriter. In this invention the whole typewriter is shown in a sound deadening casing which may have one wall or a plurality of walls and means are shown to move the carriage of the typewriter in either direction, to arrest it at one predetermined position or a plurality of predetermined positions, and to operate the line spacing mechanism of the platen of the carriage, to cause the same or different line spacing movement at different predetermined positions and to move the carriage without line spacing movement, all within the sound deadening casing and controlled by means located outside the casing. It is understood that the other parts of the typewriter are operated in a similar manner, not shown.

Other objects and advantages will appear in the following description and in the illustrative embodiment of the invention in the accompanying drawings, in which:—

Fig. 1 is a fragmentary top plan view of a typewriter showing the manner of mounting certain parts indicated conventionally in Fig. 2;

Fig. 2 is a diagrammatical view showing means, largely of an electrical nature, for carrying out the line spacing features of the invention;

Fig. 3 is a diagrammatical view showing means, largely of an electrical nature, for carrying out both the line spacing and line indentation features of the invention and showing how the carriage is made to take the motion in either direction necessary to reach a predetermined position;

Fig. 4 is a rear elevational view of a typewriter showing the manner of mounting certain parts shown conventionally in Fig. 3 and showing the typewriter placed within a sound deadening casing;

Fig. 5 is an end elevational view of one of the supporting arms shown in Fig. 4;

Figs. 6 and 7 are sectional views, taken at right angles, showing one of the stops for the carriage;

Fig. 8 is a fragmentary plan view showing a modification in the stops for the line spacing mechanism; and

Figs. 9 and 10 are views of the outside of a sound deadening casing showing means for controlling the movement and line spacing of the carriage as shown conventionally in Fig. 3.

In these drawings, a typewriter of standard make is shown largely in conventional form and much of the usual typewriter mechanism has been omitted as unnecessary for an understanding of the present invention. The frame of the typewriter is represented generally in all the drawings by reference letter A and the slidable carriage by reference letter B.

Referring more particularly to Figs. 1 and 2, there is shown a form of the invention, wherein the line spacing is accomplished by means which are electrically controlled. In that embodiment of the invention illustrated, use is made of the usual line spacing operating lever 7 and an electrically controlled pneumatic device which serves to return the carriage but which is also connected to the lever 7 so as to operate it prior to moving the carriage. Thus, the pneumatic device consists of a stationary cylinder 1, which is suitably fixed in a bracket 2 connected to the frame A of the typewriter, and a piston 3, the piston rod 4 of which is connected by a flexible connection 5 to lever 7. Inlet and exhaust pipes 6 and 7, respectively, are provided which are controlled by suitable valve mechanism operated by a solenoid 8. The arrangement is such that, when the solenoid 8 is energized, the cylinder 1 is cut off from communication with exhaust pipe 7 and fluid under pressure is admitted to cylinder 1, the latter at all other times being connected to the exhaust pipe 7.

The outer end of piston rod 4 is slidably mounted in a lug 9 on carriage B, or otherwise suitably guided, and may engage any of a series of spaced stops 10, 11, 12 and 13, the latter being fixed to carriage B. The stops 10, 11, and 12 are similar in construction and each is normally projected into the path of rod 4 by a spring 14. Each stop has a flange 15 which abuts with the lug 16 on carriage B, in which lug the stop is slidably mounted, to limit the outward movement of the stop and a flange 17 on each stop limits its movement in the opposite direction by abutment with the opposite face of lug 16. The stops 10, 11 and 12 are adapted to be withdrawn from the path of rod 4 by solenoids 18, 19 and 20, respectively, and, when so withdrawn, rod 4 moves freely until it

engages the fixed stop 13 before moving carriage B by abutment with such stop. The initial movement of rod 4 will operate lever 7 and to varying degrees according to how many of the movable stops are withdrawn from its path. If none are withdrawn, there will be no movement of lever 7 for rod 4 normally abuts stop 10. If the latter is withdrawn, rod 4 will move until it abuts stop 11 and a movement of lever 7 sufficient for single spacing will result. If stops 10 and 11 are withdrawn, double spacing will result and if stops 10, 11 and 12 are withdrawn triple spacing will result.

Means are provided, as will appear, for energizing any one of the solenoids 18, 19 or 20 and means are also provided whereby the stops 11 or 12 move the preceding stop or stops, as the case may be. Thus, stop 12 carries a finger 21 which will engage and move stop 11 and the latter carries a finger 22 which will engage and move stop 10. Therefore, if solenoid 20 is energized, stops 10, 11 and 12 will be withdrawn while, if solenoid 19 is energized, stops 10 and 11 will be withdrawn. Solenoid 18, when energized serves to withdraw stop 10 only. The usual spring associated with lever 7 causes the piston rod 4 to be retracted relatively to the carriage, whenever the cylinder 1 is connected to exhaust pipe 7, whereby it is always returned to the normal position described in readiness to effect subsequent line spacing movements.

Secured to the rear portion of frame A (see Fig. 4) are two brackets 23 (shown in detail in Fig. 5) which diverge outwardly and then extend upwardly, and finally extend forwardly in parallelism over and above the carriage B, the arrangement being such as not to interfere in any way with free movement of the carriage within its usual limits. These brackets 23 serve as a means for supporting a series of three conductors 24, 25, and 26, all of which are suitably insulated from the brackets and each of which is in the nature of a comparatively rigid trolley wire. Cooperating with the wires 24, 25 and 26 are rolls, or trolley wheels, 27, 28 and 29, respectively, carried by conducting rods 30, 31 and 32, respectively, all of which are suitably secured to and insulated from the carriage B, as indicated.

For operating the line spacing mechanism just described, a plurality of independently operable controlling means are provided, each of which is operable independently of the other and any one of which can be set, as and when desired, to effect various degrees of line spacing movement. These controlling means consist of switch keys which have an advantage in that they may be readily located at any convenient point.

A desirable arrangement of such controlling means is shown in Fig. 2, wherein are

shown a plurality of double contact depressible key switches 33 which are adapted to engage contacts 34 and 35. Each contact 35 is connected to a wire 36 which leads to one terminal of a battery 37. Each contact 34 is connected to a wire 38 which leads to and is connected with one terminal of solenoid 8 and the other terminal of the latter is connected by a wire 39 to the other terminal of battery 37. Thus, on depression of any key 33 the contacts 34 and 35 are electrically connected and a circuit is closed through battery 37 to solenoid 8, whereby the latter may be energized to effect the admission of fluid under pressure to cylinder 1 and cause a return movement of carriage B as well as an operation of the line spacing lever 7.

Each key 33 is also connected by a wire 40 to the blade 41, of a three point switch having contacts 42, 43 and 44. The contacts 42, 43 and 44 are connected to wires 45, 46 and 47, which in turn are connected to the trolley wires 24, 25 and 26, respectively. The latter, as already described, are electrically connected to the rods 30, 31 and 32, respectively. The rods 30, 31 and 32 are connected by wires 48, 49 and 50, to the solenoids 18, 19 and 20, respectively. The other terminal of each solenoid is connected to the metallic frame of carriage B, as by a wire 51. The wire 39, already described, is also connected to the metallic stationary frame A of the machine, as indicated, and, since frame A and carriage B are metallicly in contact, a connection to the other terminal of battery 37 is provided. Each blade 41 may be adjusted to engage any one of the contacts 42, 43 and 44 and therefore any key 33 can be made to energize any of the solenoids 18, 19 and 20, and thus effect single, double or triple spacing, as desired.

In connection with the apparatus just described, there is desirably provided some electrical controlling means which will effect return of the carriage without effecting a line spacing movement. To this end, a depressible key switch 52 is provided which is adapted to engage a contact 53. The switch 52 is connected to wire 38 which leads to one terminal of solenoid 8 and the wire 39, connected to the other terminal thereof, leads as described to one terminal of battery 37. The other terminal of the latter is connected by a wire 54 to the contact 53.

It is also desirable to provide some electrical controlling means for releasing the carriage B so that it may be automatically moved by the usual mechanism in a direction opposite to that in which it is moved by piston rod 4. To this end, there has been illustrated conventionally, a ratchet bar 55 which is fixed to carriage B and a holding

pawl 56 cooperating with bar 55. Pawl 56 is pivotally connected to the plunger 57 of a solenoid 58 and is normally held in engagement with bar 55 by a spring 59. The wire 36, which is connected with one terminal of battery 37, is also connected with one terminal of solenoid 58 and the other terminal of the latter is connected by a wire 60 to a depressible key switch 61. The contact 62, adapted to be engaged by switch 61, is connected by a wire 63 to the other terminal of battery 37. Thus, on depression of switch 61 an electrical circuit is closed which includes solenoid 58 and battery 37, whereby pawl 56 is withdrawn from engagement with ratchet bar 55, thus releasing the carriage.

Referring more particularly to Figs. 1 and 3 another form of the invention is shown where a plurality of motors is used in connection with the carriage return and line spacing. A solenoid 118 is shown attached to cylinder 1 having an extension of its core end in hook 116 operating in connection with pin 117 on line spacing lever 7. Energizing this solenoid will pull lever 7 in line spacing movement, while pressure in cylinder 1 will return the carriage. This operation will now be described. On depressing key 52 current will flow from battery 37 through wire 36, contact 121, insulated end of key 52, wire 122 to switch 41 associated therewith, thence through button contact 119, wire 120 to solenoid 118 and return to battery 37 through wire 51, carriage B, frame A and connecting wire. This will result in line spacing movement by means of solenoid 118. Carriage return is effected by the passage of current from battery 37, wire 36, contact 53, key 52, wire 38, solenoid 8, wire 39 to battery. Since no connection is made with solenoids 18, 19 or 20, piston rod 4 will return the carriage through connection 5. Through the use of the solenoid 118 it is possible to line space when key 52 is depressed, permitting all the other keys to cause a different line space movement therefrom as in the case of typewriting specifications.

In connection with the means already described for effecting line spacing movements, there may be, and desirably is, provided means for arresting the carriage B at various points in its range of travel for the purpose of enabling the typist to conveniently secure various degrees of line indentation in writing a letter. This object may be obtained by any suitable means but, as an illustrative example of one such means, there is disclosed in Figs. 4, 6 and 7, carriage arresting mechanism which is adapted for electrical control in a manner illustrated in Fig. 3. Preferably, this carriage arresting mechanism is so arranged as

to be capable of arresting the carriage in its movement in either direction and the mechanism will be described as so arranged.

Referring to Fig. 4, suitably fixed to some part of carriage B, such as the usual rod 65, is a depending stop 66, which although fixed to the rod is preferably adjustable longitudinally thereon. Below and parallel with rod 65 is a rod 67 which is suitably fixed at its ends in frame A. Loosely mounted on rod 67 and suitably held from axial movement thereon as indicated, are members 68, 69 and 70, which have depending arms connected by pin and slot connections (see Fig. 6) with the plungers of solenoids 71, 72 and 73, respectively. Mounted for vertical sliding movement in member 68 are a pair of spaced stops 74 (Fig. 7) which are normally held in their illustrated position by a suitable spring, such as 75. A similar pair of stops 76 are similarly mounted in member 69 but not in member 70 as the upper portion thereof forms a stop. When any of the solenoids 71, 72 or 73 are energized the stops 74, 76 or 70 will be moved into the path of the stop 66 secured to carriage B, in a manner clearly apparent from Fig. 6 and the stops are normally held out of such path by springs, such as that shown in Fig. 6 at 77. The lower face of stop 66 has on each side a bevelled corner and each pair of movable stops 74 and 76 are bevelled in opposite directions so that, as stop 66 approaches member 68 or 69 from either direction, it will engage and force down one or the other of the stops 74 or 76, as the case may be. The space between the pairs of stops 74 and 76 is just slightly greater than the width of stop 66, so that the latter, having forced down one stop of a pair and passed thereby, is arrested by abutment with the other stop of the pair and the depressed stop can again spring back into normal position, thereby holding the carriage from movement in either direction. The stop 66, when engaged by the stops 74, 76 and 70 is adapted to position carriage B for the start of a paragraph, the start of the complimentary closing line and the start of the signature line, respectively, or any other positions which may be desired for other purposes.

In connection with these stops, means are provided for controlling the carriage B to cooperate therewith. Such means include a carriage releasing device similar to that already described and identified by the same reference numerals in Fig. 3. This device permits the carriage to move in one direction under the usual impelling means provided in the typewriter and, for returning the carriage, an electrically controlled pneumatic device similar to that already described is provided and identified in Fig. 3 by the same reference numerals. This

pneumatic device also functions to effect line spacing movements, in the same manner already described and the only difference in its construction is in the provision of an additional inlet pipe 78 and a solenoid 79 to control the same. When either solenoid 8 or 79 is energized, the connection to exhaust pipe 7 will be shut off and fluid under pressure will be admitted to cylinder 2 and when neither is energized the cylinder will be connected to exhaust pipe 7. There are thus two independent electromagnetically operated means for controlling the cylinder 1, one of which means functions, as heretofore described, and the other of which means is necessary for reasons later to appear.

In connection with the electrical circuit for solenoid 79, there is provided a trolley wire 80 (Fig. 4) which is mounted in, and insulated from, the brackets 23. Below wire 80 are two other wires 81 and 82 which are mounted at slightly different levels in, and insulated from, frame A, as indicated. An arm 83 fixed to, and insulated from, rod 65, and thus movable with carriage B, carries at one end a roll 84 to ride on wire 80 and at its other end two rolls 85 and 86 which are adapted to ride on wires 81 and 82, respectively. The latter wires are of different length and of less length than the length of travel of carriage B. The intention is to have roll 85 contact with wire 81 only when stop 66 occupies a position such that it might lie between stops 74, or to the right thereof, as viewed in Fig. 4, and to have roll 86 contact with wire 82 only when stop 66 is similarly positioned with respect to stops 76. The trolley wires, rolls and arm 83 are included as a part of the electrical circuit to solenoids 79 which controls the return movement of carriage B. This return movement is to the left as viewed in Fig. 4. Therefore, if it is desired to lodge stop 66 between stops 76, with the parts occupying a position such as shown in Fig. 4, the pneumatic means for moving the carriage to the left should not only not function but should not in any way oppose the movement of the carriage to the right, under the usual mechanism effective on release of carriage B. Since roll 86 does not contact with wire 82 under the conditions described, a gap is created in the circuit to solenoid 79 to prevent operation of the carriage return mechanism. Conditions exist between roll 85 and wire 81 to effect similar results with relation to stops 74. Similar provisions are not ordinarily required with respect to stop 70 for, if the stop is positioned in relation to stops 76 at the start of the complimentary closing line, the length of this line is such as to cause stop 66 to be carried to the right of stop 70 and it can be subsequently moved into abutment therewith by the carriage return mechanism. The carriage release

mechanism therefore would not ordinarily have to function at such time, but if it did, arrangements similar to those above described could readily be provided for stop

70.

Referring now to Fig. 3; this diagram includes many circuits shown in Fig. 2 and the connection for such circuits have been given similar reference numerals. Multiple contact depressible switch keys 87, 88 and 89 are provided to control the solenoids 71, 72 and 73, respectively. One terminal of each of these solenoids is connected to a wire 90 which leads to one terminal of battery 37. The other terminals of solenoids 71, 72 and 73 are connected by wires 92, 93 and 94 to contacts 95, 96, and 97 respectively. Each of the switches 87, 88 and 89 has a contact 98 which is connected to wire 36 leading to the other terminal of battery 37, whereby on depression of any key the proper solenoid will be energized to swing its stop into the path of stop 66.

Each of the keys 87, 88 and 89 is also connected, as before, by a wire 40 to a switch blade 41 for controlling the line spacing mechanism in the manner above described. The depression of keys 87, 88 and 89 therefore also controls the line spacing mechanism and line spacing is effected to a degree dependent on the setting of that blade 41 connected to the particular key depressed. As before, a key 33 is provided to effect line spacing and full line return of the carriage, the stop for which is the usual one on the typewriter and the circuits controlled by it are the same as already described in connection with Fig. 2. The key 52 cooperates with contact 53, as before, to effect a return of carriage B without effecting line spacing movement. A carriage release key, similar to key 61, is provided which effects similar results but the connections in the diagram of Fig. 3 are somewhat different from those in Fig. 2 and will now be described. The carriage release key is shown at 99 and is connected by a wire 100 to one terminal of battery 37. The cooperating contact 101 is connected by a wire 102 to one terminal of solenoid 58 and the other terminal thereof is connected by a wire 103 to wire 39 which leads back to the other terminal of the battery.

The key 89 has a third contact 104 which is connected to wire 38 so that, when depressed, it not only energizes solenoid 73 and the line spacing solenoids but also the solenoid 8 which controls the carriage return cylinder. The keys 87 and 88 also effect an operation of the carriage return mechanism but through the agency of solenoid 79, for the special reasons above set forth. These keys each have a contact 105 which is connected by a wire 106 to one terminal of solenoid 79 and the other terminal thereof

is connected by a wire 107 to trolley wire 80. The roll 84 is always in contact with the latter and the rolls 85 and 86, connected thereto, may contact with their respective trolley wires 81 and 82, which are connected by wires 108 and 109 to buttons 110 and 111, carried by but insulated from switch keys 87 and 88, respectively. The buttons 110 and 111 are adapted to engage contacts 112 which are connected to a wire 113 leading to that terminal of battery 37 opposite from that to which contacts 98 are connected. On depression of key 87, the battery contact 98 and contact 105 are connected by the key and current flows through wire 106 to solenoid 79 and thence through wires 107 and 80 to rolls 84, 85 and 86 and, if roll 85 engages wire 81, the current returns through wire 108, button 110, contact 112 and wire 113 to the battery. Current cannot also return by way of wire 82, even though the latter is engaged by roll 86 for the button 111 is not then engaged with contact 112 and thus an open circuit exists. If, however, roll 85 did not contact with wire 81 the circuit to solenoid 79 would be open, notwithstanding the depression of key 87, so that the carriage return mechanism could not then operate to move the carriage and the latter would be moved by the usual mechanism until stop 66 engaged between stops 74.

The keys 87 and 88 are also made to control the release of the carriage B and, while they also control the carriage return mechanism, the latter, as just described, is never operable when the carriage needs to be moved by the usual carriage moving mechanism. While such mechanism is also released when the carriage needs to be moved by the carriage return mechanism, its release is idle and does not in any way interfere with the desired operation. The release of the carriage by keys 87 and 88 is effected by providing a contact 114 for each, which contacts are connected to a wire 115 which in turn is connected to the wire 102, already described. On depression of either key 87 or 88, the battery contact 98 is connected by the key to contact 114 and current flows through wires 115 and 102 to solenoid 58, returning by wires 103 and 39 to the battery.

The solenoids 18, 19 and 20 have been described as arranged to withdraw the stops 10, 11 and 12 from the path of rod 4. It is obvious that this action may be reversed so that the stops are normally held out of the path of rod 4 and are movable into such path by energization of the solenoids, in a manner indicated in Fig. 8.

Referring particularly to Figs. 4, 9 and 10, the typewriter, with the line spacing and carriage arresting mechanism, is shown located in a sound deadening casing 123 with the control of the carriage movement and

the line spacing located outside the casing. Wires 124 are shown entering the casing for the electric control of the parts and a double pipe 125, one for pressure and one for exhaust, is shown entering the casing. It will be readily understood that, when a typewriter is so located, direct manual operation is no longer desirable. It becomes a necessity to have the parts of the typewriter operated mechanically by a force other than manual and then control the operation by means operated manually outside the casing. Not only will the noise of the typewriter be entirely eliminated by a properly constructed casing but the operator will be relieved of the physical labor involved, which is considerable. In this invention the control of the operating parts is shown by electric means and, since electric make and break can be effected with less than half an ounce resistance, physical effort is practically eliminated. In the foregoing descriptions, the operation of the parts is shown and also the control by electric contact keys, although other means could obviously be used. The typing of an ordinary business letter will now be described. It is understood that the carriage is to be arrested in its movement at four different positions, the beginning of a full line, for which the usual stop on the typewriter is used, the beginning of the paragraph for which stop 68 is used, the beginning of the complementary closing line, for which stop 69 is used, and the beginning of the signature line for which stop 70 is used. These are controlled by keys 33, 87, 88 and 89 respectively.

After placing the sheet on the platen in position for dating, the casing is closed. After the date line is typed, key 33 is depressed and, if its switch 41 is set for single line spacing, the carriage will be returned to the beginning of a full line and the platen spaced one line. It is understood that key 52 could be used and the line spacing effected through solenoid 118. Now the address is typed using the same key as before for the usual three lines of an address, each spaced from the other by a single space. Next the same key is depressed twice in order to double space for the usual "Dear Sir" or "Gentlemen", but starting at the full line position. Next key 87 is depressed and, if its switch 41 is set for double spacing, the carriage will move from wherever it may be to the paragraph position and the platen will be double spaced. After the first line of the paragraph is finished key 33 is again depressed and the carriage will return to full line position, the platen being single spaced. Key 33 is used for each line of the paragraph, resulting in each line starting from full line position and each line single spaced from the others. Next key 87 is

again depressed and the carriage again moves from wherever it may be to paragraph position with the platen double spaced. Each following paragraph is typed in a similar manner. After typing the last line of the last paragraph, key 88 is depressed and, if its switch 41 is set for double line spacing, the carriage will move from wherever it may be to the complementary closing line position with the platen double spaced.

After typing the complimentary closing line, key 89 is depressed and, if its switch 41 is set for double line spacing, the carriage will be returned to signature position with the platen double spaced. After finishing the signature line it is customary to type the initials of the dictator and the operator of the letter at the extreme left and in full line position and for this key 33 is again depressed. The letter is now finished, the casing opened, and the sheet removed. Thus the letter has been typed with the typewriter and operating parts inside the casing thus eliminating the noise thereof, the automatic carriage movement from wherever it may be to each of the carriage arresting positions has been effected as well as the single and double line spacing of the platen, and all under the complete control of the operator through the various keys and, since these keys may be adapted to have less than half an ounce resistance to manual operation the physical labor of the operation has been eliminated. As a result of all this the operator and her apparatus can be placed near a busy man's desk without disturbing him and the operator should be able to do considerably more work in a given time.

The invention has been disclosed herein for illustrative purposes but the scope of the invention is defined by the appended claims rather than by the foregoing description.

Claims:

1. A typewriter having in combination, a platen adapted to hold a sheet and having operable line spacing mechanism adapted to be set for a predetermined line spacing movement, said operable line spacing mechanism including controlling means on the movement of which the operation of said mechanism will result in different line spacing movement from the predetermined setting, and said controlling means being adapted for an automatic return movement to its original position.

2. A typewriter having in combination, a slidable carriage movable between two extreme positions, spring-operated means to advance the carriage and power operated means to return the carriage and reenergize said spring operated means, means to arrest the carriage at a predetermined position

between said extremes and controlling means acting automatically to advance or return the carriage according to the motion necessary to reach said predetermined position.

3. A typewriter having in combination, a slidable carriage movable between two extreme positions, a stop to arrest the carriage at a predetermined position between said extremes, a platen adapted to hold a sheet and provided with operable line spacing mechanism adapted to be set for a predetermined line spacing movement including controlling means to permit a different line spacing movement from the original setting, and means to set said stop and operate said controlling means.

4. A typewriter having in combination, a slidable carriage movable between two extreme positions, a stop to arrest the carriage at a predetermined position between said extremes, a platen adapted to hold a sheet and provided with operable line spacing mechanism adapted to be set for a predetermined line spacing movement including controlling means to permit a different line spacing movement from the original setting, and means operable in one movement to set said stop and operate said controlling means.

5. A typewriter having in combination, a slidable carriage movable between two extreme positions and a stop to arrest the carriage at a predetermined position between said extremes, a platen adapted to hold a sheet and provided with line spacing mechanism adapted to be set for a predetermined line spacing movement, controlling means to permit a different line spacing movement from the predetermined setting, and power operated means to set said stop and operate said controlling means.

6. A typewriter having in combination, a platen adapted to hold a sheet and operable line spacing mechanism adapted to be set for a predetermined line spacing movement, said operable line spacing mechanism including controlling means on the movement of which the operation of said mechanism will result in different line spacing movement from the predetermined setting.

7. A typewriter having in combination, a platen adapted to hold a sheet and having operable line spacing mechanism adapted to be set for a predetermined line spacing movement, said operable line spacing mechanism including controlling means on the movement of which the operation of said mechanism will result in different line spacing movement from the predetermined setting, and means to operate said controlling means.

8. A typewriter having in combination, a platen adapted to hold a sheet and having operable line spacing mechanism adapted to be set for a predetermined line spacing movement, said operable line spacing mechanism including power operated controlling

means on the movement of which the operation of said mechanism will result in different line spacing movement from the predetermined setting.

9. A typewriter having in combination, a slidable carriage movable between two extreme positions, a stop to arrest the carriage at a predetermined position between said extremes, a platen adapted to hold a sheet and provided with operable line spacing mechanism adapted to be set for a predetermined line spacing movement including controlling means to permit a different line spacing movement from the original setting and means to set said stop, and hold said carriage from further movement in either direction.

10. A typewriter having in combination, a slidable carriage movable between two extreme positions, a stop to arrest the carriage at a predetermined position between said extremes, a platen adapted to hold a sheet and provided with operable line spacing mechanism adapted to be set for a predetermined line spacing movement including controlling means to permit a different line spacing movement from the original setting and means to set said stop.

11. A typewriter having a movable carriage provided with a line spacing mechanism, means to advance and return the carriage, means to arrest the carriage at a number of predetermined positions, a plurality of controlling elements, one for each position, each one acting to make the carriage automatically take the direction, whether in advance or return movement, necessary to reach its own predetermined position, and to operate the line spacing mechanism to cause the same degree of line spacing movement as that caused by another of said controlling elements.

12. A typewriter having a movable carriage provided with a line spacing mechanism, means to advance and return the carriage, means to arrest the carriage at a number of predetermined positions, a plurality of controlling elements, one for each position, each one acting to make the carriage automatically take the direction, whether in advance or return movement, necessary to reach its own predetermined position, and to operate the line spacing mechanism to cause a different degree of line spacing movement from that caused by another of said controlling elements.

13. A typewriter having a movable carriage provided with a line spacing mechanism, means to advance and return the carriage, means to arrest the carriage at a number of predetermined positions, a plurality of controlling elements, one for each position, each one acting to make the carriage automatically take the direction, whether in

advance or return movement, necessary to reach its own predetermined position, and to operate the line spacing mechanism, and adaptable to cause the same as or a different degree of line spacing movement from that caused by another of said controlling elements.

14. A typewriter adapted to type the usual form of business letter, having two carriage arresting positions for the body of the letter, the beginning of a full line and the beginning of a paragraph; a carriage arresting mechanism for the paragraph position adapted to arrest the carriage in either advance or return movement, and means to actuate said arresting mechanism.

15. A typewriter adapted to type the usual form of business letter having two carriage arresting positions, the beginning of a full line and the beginning of the com-

plimentary closing line; a carriage arresting mechanism for the complimentary closing line adapted to arrest the carriage in either advance or return movement, and means to actuate said arresting mechanism.

16. A typewriter adapted to type the usual form of business letter having two carriage arresting positions for the body of the letter, the beginning of a full line and the beginning of a paragraph; a carriage arresting position for the complimentary closing line and a carriage arresting position for the signature line; carriage arresting mechanism for each of the last three positions and means to selectively arrest the carriage at any one of the last three positions.

In testimony whereof I have affixed my signature.

FRANK B. POWERS.