

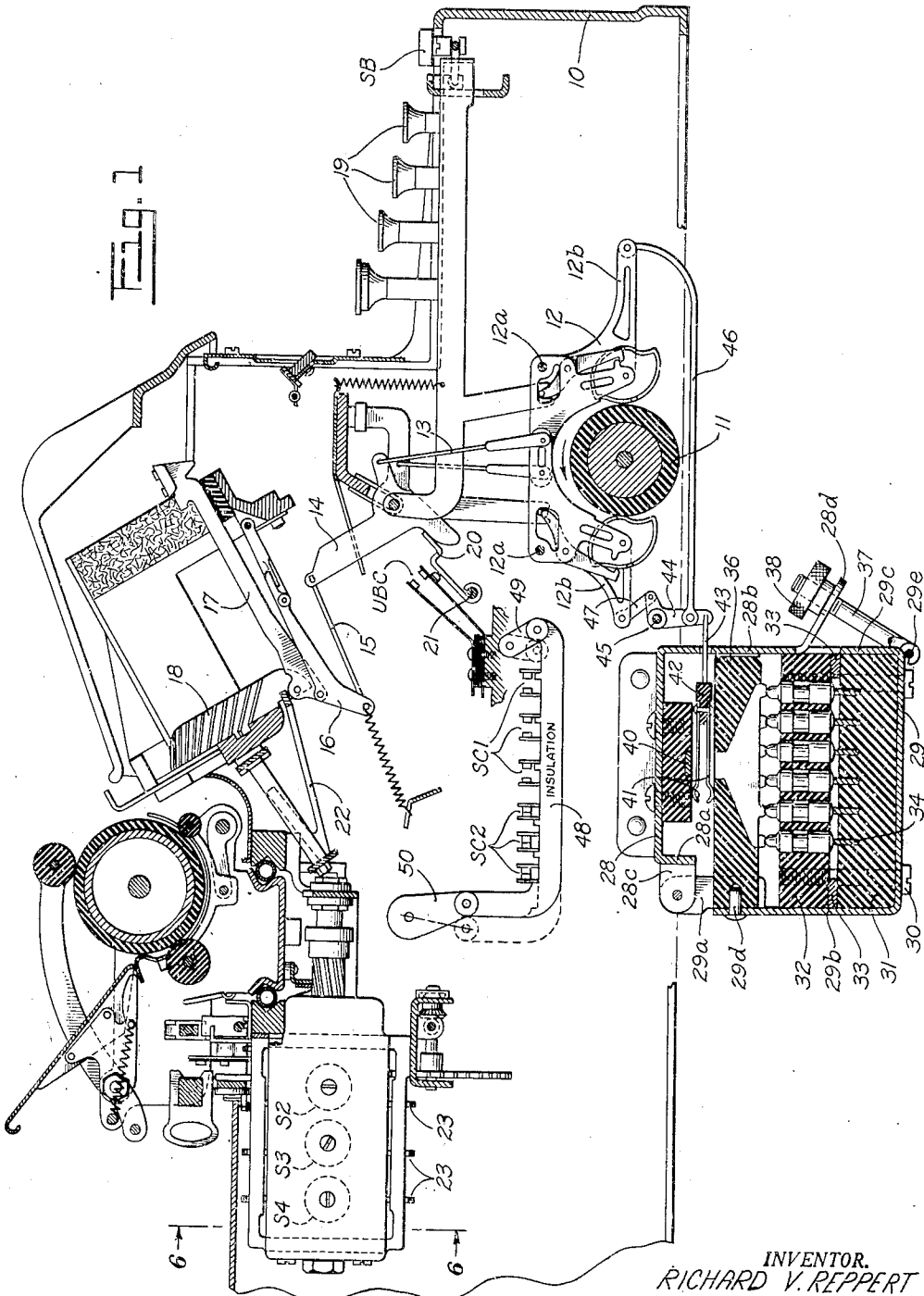
Nov. 8, 1949

R. V. REPERT  
SELECTIVE SWITCH MECHANISM FOR  
VARIABLE SPACING TYPEWRITERS

2,487,373

Filed March 19, 1947

3 Sheets-Sheet 1



INVENTOR.  
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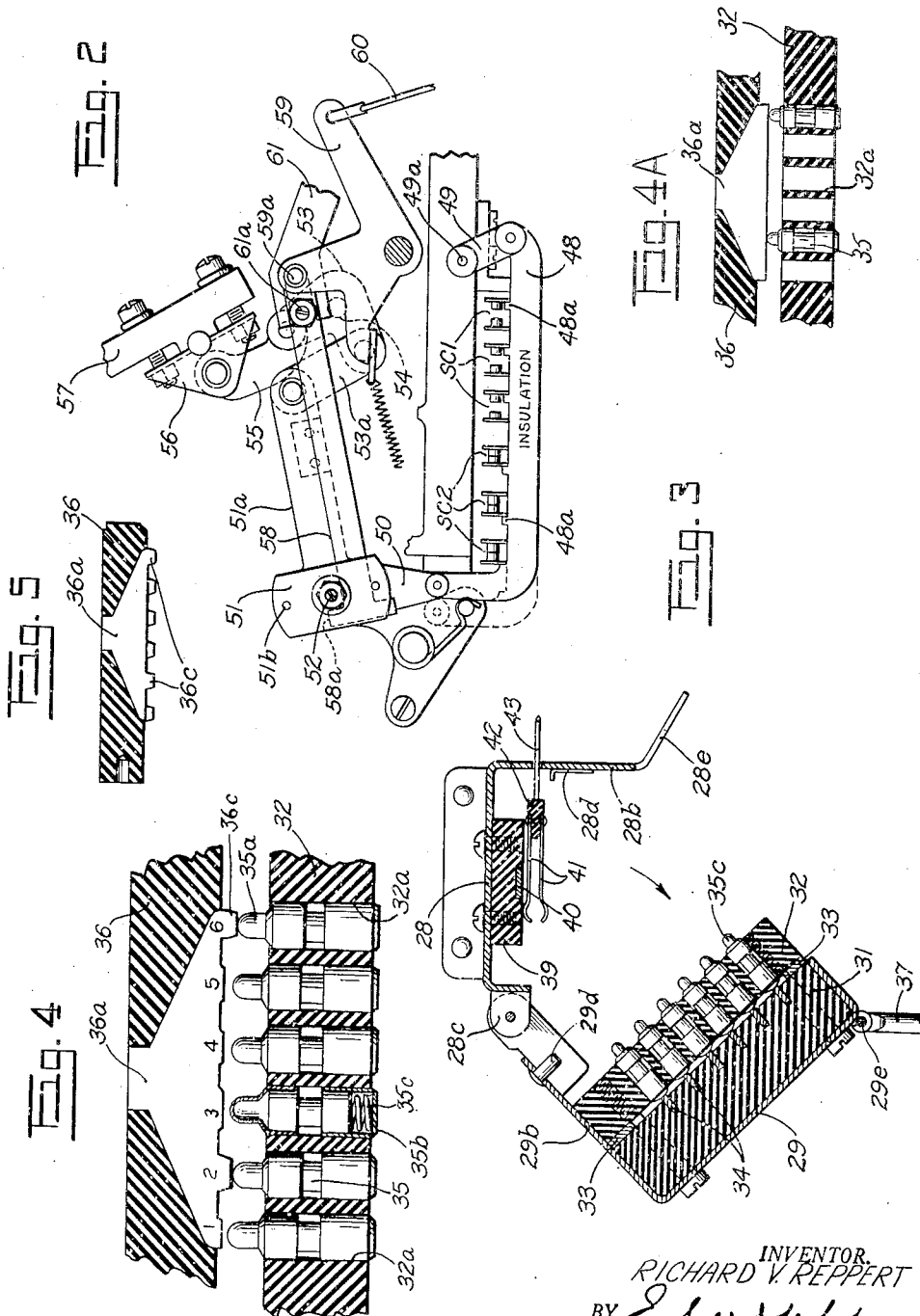
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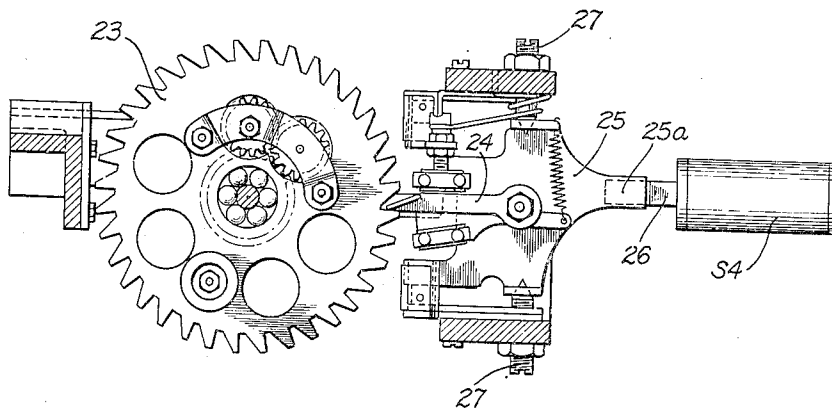


Fig. 6

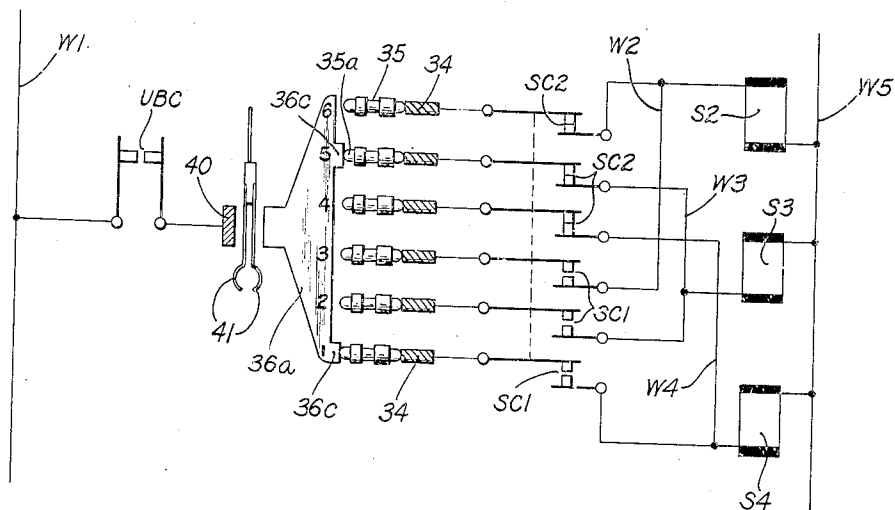


Fig. 7

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# UNITED STATES PATENT OFFICE

2,487,373

## SELECTIVE SWITCH MECHANISM FOR VARIABLE SPACING TYPEWRITERS

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19 Claims. (Cl. 197—84)

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This invention relates to typewriting machines, more particularly to typewriters in which the printed characters are spaced variably in proportion to their widths.

The primary object of the present invention is to provide a novel means of controlling the selection of the spacings for the different characters printed.

Another object is to provide a means for controlling an electrically controlled variable spacing mechanism.

An object is to provide an improved contact mechanism for selecting the electromagnets of a magnetically controlled variable spacing mechanism.

An object is to provide a power operated contact device suitable for use in variable spacing typewriters in which the instrumentalities of the machine, such as the typing mechanism, are operated by power.

Another object is to provide a contact mechanism which may be readily changed by the operator when it becomes necessary to change the spacing to suit different type faces.

Another object is to provide a contact mechanism which includes a pre-setup selection controlling member which may be removed as a unit from the machine and replaced by a similar unit having a different selective control.

An object is to provide an electrical contact mechanism for selecting the controlling magnets of a variable spacing mechanism and which includes a contact block which is readily removable from the machine and which may be fabricated to suit a specific type face, the contact blocks for different type faces having the contact elements differently arranged whereby each removable block causes the contact mechanism to have a different selective effect from other contact blocks which are interchangeable therewith.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

Fig. 1 is a vertical section view of a typewriting machine showing the contact mechanism attached thereto.

Fig. 2 is a large scale detail view showing the shift mechanism in lower case position.

Fig. 3 is a detail view showing the contact mechanism assembly opened and with the contact block removed.

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Fig. 4 is a large scale vertical section showing one of the elements of the contact block in cooperation with the cooperating contact devices.

Fig. 4A shows a modification of the structure shown in Fig. 4.

Fig. 5 is a cross section of the removable contact block.

Fig. 6 is a rear elevation, partly in section, of one of the escapement mechanisms.

Fig. 7 is a wiring diagram.

The drawings illustrate the invention as applied to the well known "Electromatic" variable spacing typewriter which is disclosed in Patent No. 2,224,766. However, it will be understood that the invention is not limited to the particular type of machine shown but may be used in other machines, whether manually or power operated, without departing from the basic principles of the invention. Only a very brief description of the machine will be given herein and for further details reference may be had to the above patent.

In Fig. 1 the usual base is designated 10 in which is mounted the power roller 11 turning in the direction of the arrow. Cooperating with the power roller 11 are the usual cam units 12 which are pivotally mounted on the cross rods 12a. Cam units 12 are connected by the links 13 to the sub-levers 14 which, in turn, are connected by links 15 to the type bar operating toggles 16. These toggles are connected to the type bars 17 which are mounted on the usual wire segment 18. The cam units 12 are controlled by the character keys 19. When the keys 19 are depressed, the cam units 12 are rendered operable by the power roller 11 in a well known way, rotating in the direction of the arrow (Fig. 1) and drawing down the links 13 to operate the type bars 17.

The sub-levers 14 operate a universal bar 20 which is pivoted at 21 in the base 10. The universal bar 20, as usual, operates the ribbon mechanism and, in the present case, additionally operates a pair of contacts UBC which will be termed the universal contacts. In the machine disclosed in the patent, the type bars 17 actuate the variable spacing mechanism through a universal bar 22 but in the present case this universal bar is not used for that purpose but may be retained in the machine as a means of assisting in the restoration of the type bars.

The variable spacing mechanism has been modified to permit it to be operated by space selecting magnets designated S2, S3, S4 in Figs. 1 and 7, there being one magnet for each of the individual escapement mechanisms disclosed in the patent. Each escapement mechanism in-

cludes an escapement wheel 23 and, in Figs. 1, 6, and 7, the numerals in the designations of the magnets S2, S3, S4 indicate the number of units of spacing effected by the corresponding escapement wheels 23 exactly as in the above patent. The rearmost or left hand wheel (Fig. 1) thus effects four units of spacing for operation, whereas the extreme right hand wheel effects two units of spacing and the middle wheel three units of spacing.

These escapement wheels are controlled by the escapement dogs 24 (Fig. 6) mounted on the dog rocker plates 25. Each dog rocker plate is provided with an extension 25a acting as an armature in cooperation with the pole 26 of the corresponding magnet, such as S4. Thus, the energization of the proper magnet S2, S3 or S4 causes the dog rocker plate corresponding thereto to be rocked on its pivots 27, as in the above patent, thereby permitting the escapement wheel 23 to rotate one tooth space. The escapement wheels 23 have different numbers of teeth to effect the spacings of two units, three units, and four units, respectively as in the above patent.

The magnets S2, S3, S4 are controlled, according to the present invention, by means of a novel contact mechanism which is selectively actuated by the cam units 12. This contact mechanism is mounted underneath the machine in approximately the same relative position as the mechanical selector mechanism disclosed in the above patent. Secured in the sides of the base 10 (Fig. 1) is a channel shaped frame member 28 formed with a short vertical flange 28a and a longer vertical flange 28b which extend downwardly (see Fig. 3 also). The short vertical flange 28a is formed at its ends with the ears 28c to which are pivoted the lugs 29a of a channel shaped frame 29 formed with the longer vertical flange 29b and the shorter vertical flange 29c.

Secured to the top face of the main part of the channel shaped member 29 (Figs. 1 and 3) by means of the screws 30, are the base block 31 and the fixed contact block 32, spacing strips 33 being interposed between the base block 31 and the fixed contact block 32. The base block 31 is preferably made of insulating material, such as a molded plastic, and in the top surface of the block are molded the common contact strips 34 which are spaced at equal intervals transversely of the base block 31 and are set edgewise in said block so as to extend parallel with the longer edges of said block. The fixed block 32 also is made of an insulating material and has formed therein as many transverse rows of holes as there are cam units 12 and the rows of holes are spaced the same as the cam units. There are six of these holes 32a in each row and the holes are aligned vertically with the bars 34.

Received in the holes 32a, as best shown in Fig. 4, are the contact elements 35 which may consist of small germanium crystal diode rectifiers of well known form or other suitable rectifiers may be used. These rectifiers are shaped like miniature fuses and are identified in the trade by the designation 1N34. The diodes 35 each have a cap piece 35a of conducting material fitting one of the metal end ferrules of the diode fairly tightly but having a sliding fit in the holes 32a. A second cap piece 35b is provided for the opposite ferrule of each diode 35 and not only is loosely slidable in a hole 32a but loosely receives the ferrule. A spring 35c is interposed between the end of the ferrule and the cap 35b and tends to press caps 35b down on the bars 34 and also

urge diodes 35 and their caps 35a upwardly into good electrical contact with the contact plates 36a described in the next paragraph. The diode rectifiers are arranged so the caps 35a are placed on the ferrules of the same electrical polarity, for instance on the positive ferrules so that current can flow only in one direction between plates 36a and bars 34 to prevent back circuits from being established from one plate 36a to another by way of the bars 34, particularly when the magnets S2, S3, S4 are selected in combinations.

Located immediately above the rows of contact elements 35 is the removable contact block 36 (Fig. 5) which is composed of an insulating material like molded plastic in which are molded the contact plates or elements 36a. The block 36 is provided with several holes along its rear or left hand edge (Figs. 1 and 5) into which project pins 29d carried by the flange 29b. Secured to the flange 28b, as best shown in Fig. 3, is an angular stop bar 28d against which the removable contact block 36 is pressed by the action of the springs 35c.

The contact plates 36a are formed with contact lugs 36c which cooperate with the ends of the contact elements 35 and which hold the spring 35c slightly compressed when the contact mechanism is properly assembled as in Fig. 1.

There are six possible positions for the lugs 36c and it will be noted by reference to Fig. 1 that the effect of the lugs 36c is to render the contact elements 35 selectively capable of connecting the plates 36a to the common contact strips 34 singly or in different combinations. Thus the particular plate shown in Figs. 1, 4, and 5 connects the second and sixth contact bar 34 from the left in Fig. 4 to the plate 36a. It will be understood that the lugs 36c will be placed in different positions according to the selection it is desired to make for a particular character. The manner in which this selection is effected will be more clearly seen from the description which follows:

The parts of the contact mechanism are held in the position of Fig. 1 by means of clamping screws 37 which are pivoted at 29e to the frame member 29. The frame member 28b is formed with cooperating bent-over lugs 28d having open slots into which the clamping screws 37 may be swung and the thumb screws 38 tightened. By loosening the thumb screws 38 and swinging the clamping screws 37 clockwise the frame member 29 may be swung down to the position of Fig. 3, thereby permitting the removal of the removable contact block 36 and its replacement by another one in which the lugs 36c are differently disposed for one or more characters.

Secured to the main part of the channel shaped member 28 and extending lengthwise thereof is a bar 39 of insulating material, in the lower surface of which is molded a common contact strip 40 which extends over the length of that part of the contact block 36 having the plates 36a. Interposed between the top surface of the contact block 36 and the bar 39 are the sliding contact members 41 which are secured together in pairs by metallic rivets to the insulating blocks 42, there being a block 42 and a pair of the contact members 41 for each plate 36a, and the ends of the contact members 41 are bent so as to be capable of sliding onto the upper reduced portion of the plate 36a and the bar 40 so as to connect said bar and said plate together.

There is a pair of contacts 41 and a block 42 to correspond with each plate 36a and there are as many plates 36a as there are keys in the

keyboard including the space bar SB (Fig. 1), the space bar, as usual, controlling a cam unit like the cam units 12.

The contact members 41 are operated individually when the keys are depressed and for this purpose are connected by links 43 to the bell cranks 44 pivoted on the cross rod 45. The bell cranks 44 are connected by the links 46, 47 to extensions 12b formed in the frames of the cam units 12, the links 46 being curved to pass around the power roller 11. The cam units 12 are arranged on opposite sides of the power roller 11 and the arms to which the links 13 are connected are staggered as clearly shown in Fig. 1. The bell cranks 44 are alternately connected by the links 46, 47 to the cam units, the front or right hand cam units (Fig. 1) being connected to the depending longer arms of the bell cranks 44 while the links 47 are shorter and connected to the upper short arms of the bell cranks 44. It is apparent that when the cam units 12 are operated by the power roller the bell cranks 44 will be rocked counterclockwise and draw the links 43 to the right, thereby drawing the pair of contact members to the right to establish an electrical connection between the plate 36a corresponding to the particular key depressed and the common contact bar 40.

It will be noted that when a particular cam unit 12 is rendered operative by the depression of the appropriate key 19 the associated one of the plates 36a will be electrically connected to the bar 40 and, as will be made clearer hereinafter, one or more space selecting circuits is established, thereby to select one or more of the solenoids S2, S3, S4. However, only a single selection can be made in this manner under control of the keys alone and, since in most typewriters each key represents two or more characters, provision is made whereby a second selection is effected to change the effect of connecting a particular plate 36a to the common bar 40. Mounted in the base of the machine are two sets of contacts designated SC1 which are normally open, and SC2 which are normally closed. These contacts are of a conventional type in which one blade may be spring biased toward the other to effect closure in the case of contacts SC1, or biased away from the other to effect opening in the case of contacts SC2.

The contacts SC1, SC2 normally are held in the condition of Figs. 1 and 2 by the contact operating bar 43 having lugs 48a engaging the spring biased members of the contacts SC1, SC2 to normally hold the contacts SC1 open and the contacts SC2 closed. The bar 43 is preferably made of insulating material supported at its right hand or front end by the link 49 pivoted at 49a to a fixed part of the machine and at its left hand end by an arm 50 which is formed as part of the usual T-lever 51 of the case shift mechanism. This mechanism is similar to the one disclosed in Patent No. 1,945,097.

The T-lever 51 is pivotally mounted at 52 on a fixed part of the machine and has the long arm 51a connected by a link 53a to the bell crank 53 secured to the shaft 54. The bell crank 53 is connected by a link 55 to a bracket 56 adjustably mounted on the type basket 57, there being two bell cranks 53, two links 55 and two brackets 56, customarily provided in the machine. The means for operating the lever 51 comprises a T-shaped arm 58 pivoted at 59a to a three-armed lever 59 which is connected by a link 60 to the usual shift cam-unit (not shown). The arm 58

also has a pin and slot connection 61a to an extension 61 on the usual shift key.

The shift mechanism operates exactly as described in the above patent. When the shift key is depressed the portion 61 shown in Fig. 2 is raised, thereby elevating the left hand end of the arm 58 to place the upper lug 58a in horizontal alignment with a pin 51b on the lever 51. The cam unit controlled by the shift key is simultaneously rendered operative by the power roller, thereby drawing the link 60 diagonally downward to the right in Fig. 2. This causes the arm 58 to be drawn to the right, thereby rocking the lever 51 clockwise and causing the type basket 57 to be drawn downwardly in the well known way to the upper case position. The aforesaid movement of the lever 51 also carries the contact operating bar 48 to the left to the dotted line position, thereby permitting the contacts SC1 to close and the contacts SC2 to open.

The contacts SC1, SC2 are connected in pairs to the wires W2, W3, W4 in the manner shown in Fig. 7 which illustrates the circuits associated with only a single key. There is a set of contacts SC1 or SC2 connected with each of the common bars 34. The lowest contacts SC1 and the lowest contacts SC2, associated with the first and fourth bars 34 from the bottom in Fig. 7, are connected in common by the wire W4 to the magnet S4 which controls four units of spacing. The second and fifth bars 34 are connected through contacts SC1 and SC2 and wire W3 to the magnet S3, while the third and sixth bars 34 are connected through contacts SC1, SC2 and wire W2 to the magnet S2 which controls two units of spacing.

It is apparent from Fig. 7 that the placing of the lugs 36c as there shown creates the possibility of closing a circuit either through the magnet S3 by way of contacts SC2 or through magnet S4 by way of contacts SC1. Normally the contacts SC2 are closed while typing is effected in the lower case position of the type basket 57 and a circuit will be established as follows when the particular key 19 associated with the plate 36a in Fig. 7 is depressed: Line wire W1, contacts UBC which are closed by the universal bar 20 when the type bar is operated, the common contact strip 40, the contacts 41 associated with the key depressed and which are operated by the cam unit 12 controlled by that key, the upper lug 36c, the cap 35a and contact element 35 associated with the lug 36c, common bar 34, contacts SC2, wire W3, and magnet S3 to wire W5. The energization of the magnet S3 causes the three-unit escapement 23 to be operated and the carriage will be spaced three units to suit the lower case character typed.

The upper case characters are frequently wider but sometimes are narrower than the lower case characters and for this reason it is desirable to change the spacing in many instances when an upper case character is printed. This change in spacing may be effected by closing all of the contacts SC1 to cause a different one of the magnets S2, S3, S4 to be energized. In Fig. 7, the plate 36a is provided with two lugs in what may be termed the 1 and 5 positions as designated by the small numbers 1 to 6 in Figs. 4 and 7. When the shift key is depressed and the shift mechanism is rendered operative as described above, all of the contacts SC2 open and all of the contacts SC1 close. This prevents a circuit from being established through the lug 36c in the 5 position and now enables a circuit to be established

through the lug 36c for the 1 position to the magnet S4, thereby causing the upper case character to be spaced four units instead of three.

It will be understood that a simple case has been considered where only one lug was involved for the upper and lower case positions. It will be clear, however, that the lugs 36c may be disposed in any desired manner and in any desired combinations so as to either augment or reduce the spacing when a shift to upper case is effected. In some cases, for example the keys which have double punctuation marks, there may need to be no change in the upper case spacing. Thus, in the case of a double period key there may need to be no change in spacing.

In Figs. 4 and 5 the plate 36a is provided with lugs in the 2 and 6 positions. With this arrangement of lugs the lower case character will be spaced three units by energization of the magnet S3 while the upper case character will be spaced four units by energization of the magnet S4.

It will be seen from the foregoing that it is possible to make up the removable contact block 36 to suit any desired schedule of spacings to correspond with the set of type bars and font of type with which the machine is equipped at assembly. If it becomes necessary to replace some of the type bars in the machine with new type bars having different characters, it will be a simple matter to remove the contact block 36 and substitute another one in which the plates 36a have been adapted to the changed type. It is also possible, if it is desired to change the spacing for the same set of type, to substitute a different block having the lugs 36c re-arranged. For example, it might be desired to increase the spacing of all characters one additional unit for some special purpose.

Another advantage of the contact mechanism disclosed is that it may be employed in a machine having removable type shuttles or printing wheels, such as the "Varityper," in which the size or the style of type may be changed at will. It will thus be seen that the contact mechanism has advantages which adapt it for use in other commercial machines than the one disclosed which is selected purely for purposes of illustration.

In the drawings the contact mechanism is shown as comprising a plate 36a for each key, which plate is provided with lugs in various positions so as to have a selective effect in establishing circuits to the magnets S2, S3, S4.

This feature of construction is not absolutely necessary and may be modified by making the plates 36a with lugs in all positions or straight edged and removing the contact elements 35 for the positions in which contact is not to be made. For example, in Fig. 4A the block 36 may be made of identical plates 36a in which the lower edge is plain. By removing the contact elements 35 for the first, third, fourth, and fifth positions, whereby only two contact elements 35 in the second and sixth positions are provided, exactly the same effect will be produced. Conveniently the plate 32 may receive the contact elements 35 loosely, and has the added advantage of permitting the operator to change at will the setup of the contact elements 35 for any particular key.

It will be understood, therefore, that it is not desired to limit the construction to the specific form shown in the drawings.

While there have been shown and described and pointed out the fundamental novel features of the invention, as applied to a preferred embodiment; and a single modification, it will be

understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. In a variable spacing typewriter having means for printing characters of varying widths, a variable spacing mechanism, and keys for controlling the printing of characters; the combination of a series of space selecting magnets for controlling the spacing mechanism, circuits for controlling said magnets; and contact means controlled by said keys for selectively closing said circuits singly and in combination, said contact means including, for each key, a main contact device rendered operative by the key to close a circuit, said device including a main fixed contact, and one or more contacts coacting with said main contact device for selectively establishing connections to said circuits whereby the operation of any key causes the closure of one or more of the circuits to energize one or more of said magnets and select a spacing for the character represented by said key corresponding to the width of the character.

2. In a machine having means for printing characters of varying widths, selecting members representing the characters, and variable spacing mechanism including space selecting elements representing several different degrees of spacing; the combination with said selecting elements of a series of operating magnets for said elements; and contact mechanism for selecting said magnets, said mechanism including a series of separate circuit closing devices, each associated with a selecting member and rendered operative by said selecting member, a contact bar having a series of contact plates, one for each of the circuit closing devices, and a second contact bar having a series of transverse rows of contact elements, one row for each of said plates, the contact elements of each row corresponding to the magnets, said second bar having associated therewith a series of common contact bars each having a connection to one of said magnets and engaging all of the contact elements corresponding to said one magnet, each of said plates being shaped to engage only predetermined ones of said contact elements whereby the operation of selected circuit closing devices closes circuits through the associated contact plates and predetermined ones of said contact elements to certain of said magnets.

3. In a machine having means for printing characters of varying widths, selecting members representing the characters, and variable spacing mechanism including space selecting elements representing several different degrees of spacing; the combination with said selecting elements of a series of operating magnets for said elements; means for selectively closing circuits for said magnets comprising a pair of spaced contact bars, one bar having a series of transverse contact plates, one for each selecting member, the other bar having a series of rows of transverse contact elements, each of said plates having electrical contact with only certain ones of the contact elements of a certain row, said contact elements corresponding to said magnets, means to connect all of the elements corresponding to each magnet in common to such magnet, a contact bar common to said plates, and a series

of contact wipers, each corresponding to a selecting member; and means controlled by said selecting members for operating said wipers.

4. In a machine having means for printing characters of varying widths, selecting members representing the characters, and variable spacing mechanism including space selecting elements representing several different degrees of spacing; the combination with said selecting elements of a series of operating magnets for said elements; and switching mechanism for selectively closing circuits to said magnets, said switching mechanism comprising four parallel bars of insulating material, the first bar having a longitudinal contact bar, the second bar being spaced from the first and having a row of transverse contact plates arranged longitudinally of said bar, each of said plates corresponding to one of the selecting members, the third bar having a series of rows of contact elements arranged transversely of the third bar and confronting said transverse plates, certain of the elements in each row electrically contacting the confronting transverse plate, the fourth bar having a series of common contact bars extending longitudinally of said bar and electrically connecting the corresponding contact elements of said rows to said magnets, and a series of contact wipers, one for each plate, interposed between the first and second bars and movable transversely thereof to electrically connect the first named bar to one of said plates; and means controlled by the selecting members for operating said wipers.

5. In a variable spacing typewriter having a bank of character keys representing characters of different widths and having a series of space selecting elements; the combination of a series of parallel rows of contact elements, each row representing a predetermined extent of character spacing; a series of magnets for operating said selecting elements and representing the different extents of character spacing, means for connecting the rows of contact elements of predetermined spacing to the corresponding magnets; a series of contact plates, one for each key, each contact plate bridging all of said rows and making selective electrical contact singly or in various combinations with different ones of the contact elements in said rows according to a prearranged plan of spacing of the characters; and contact means associated with said keys and rendered operative thereby for selectively closing circuits through said plates.

6. In a machine having mechanism for printing characters of varying widths and having a series of character selecting elements, each causing the printing of at least one character, and having a series of space selecting elements; the combination of electrically actuated devices for operating the space selecting elements, said devices representing extents of spacing; a series of rows of contact devices, each row corresponding to the extent of spacing represented by one of the electrically actuated devices, said series corresponding to the characters of a case type printed by the printing mechanism; a series of contact plates, one plate for each character selecting element, each plate extending transversely of all of said rows and being rendered electrically conducting with a contact device in at least one of said rows; means for connecting the contact devices of each row in common to the corresponding one of the electrically actuated devices; and selective contact means controlled by the character selecting elements for closing circuits to said

plates and, through said plates and said contact devices, to said electrically actuated elements.

7. In a machine having mechanism for printing characters of varying widths and having space selecting elements and a series of character selecting elements, each causing the printing of at least one character; the combination of electrically actuated devices for operating the space selecting elements, said devices representing extents of spacing; a series of rows of contact devices, each row corresponding to the extent of spacing represented by one of the electrically actuated devices, said series corresponding to the characters of a case of type printed by the printing mechanism; a series of contact plates, one plate for each character selecting element, each plate extending transversely of all of said rows and being rendered electrically conducting with a contact device in at least one of said rows; means for connecting the contact devices of each row in common to the corresponding one of the electrically actuated devices; a series of power devices for actuating the printing mechanism, one power device for each character selecting element and plate and rendered effective by such element; and a series of movable contact elements, each engageable with one of said plates and actuated by one of said power devices for selectively closing circuits to said plates under control of said character selecting elements.

8. In a machine having mechanism for printing at least two cases of type characters of varying widths and having space selecting elements and a series of character selecting elements, each causing the printing of at least one character, the combination of electrically actuated devices for operating the space selecting elements, said devices representing extents of spacing; a plurality of series of parallel rows of contact devices, each series corresponding to a case of type printed by the printing mechanism, one row in each series corresponding to one of said electrically actuated devices; a series of contact plates, one for each character selecting element and extending transversely of said rows of contact devices, each plate having selective electrical contact with one or more of the contact devices in both series of rows according to a predetermined plan; selective contact means controlled by the character selecting elements for closing circuits to said plates, case selecting means, and contact means controlled by the case selecting means for selectively connecting a predetermined one of the plurality of series of rows of contact devices to the electrically actuated devices for each change of case.

9. In a variable spacing typewriter, a series of rows of contact elements, each row representing a group of spacings, any one or more of which may be allotted to a single character; a series of common contact members, each member extending along a single row and being made current conducting with preselected contact elements of the related row to represent the spacing allotted to the corresponding character, variable spacing mechanism including electric actuating devices representing the different spacings of said group, means for connecting all of the contact elements representing the same spacing in common to the corresponding actuating device; a series of character selecting devices, each representing at least one character; and circuit closing means controlled by the selecting devices for closing circuits to said common contact members.

10. A space selecting switch mechanism for



variable spacing typewriters comprising two sets of common contact members, one set representing character spacings and the other set extending transversely of the first set and representing the characters of a font of type, the individual contact members of the two sets being selectively made electrically conducting at one or more of their intersectional points to precondition the switching mechanism for selection of certain spacings according to the widths of the characters represented by the second named set of common contact members; and circuit closing means, one for each member of the second named set of members, for selectively closing circuits to common contact members representing characters.

11. A space selecting switch mechanism for variable spacing typewriters comprising two series of intersecting contact members, one series representing spacings and the other series representing characters, each series being disposed crosswise of the other, the first series comprising two groups of members, each group corresponding in value of spacings to the other group, said groups representing the character spacings of two cases of characters; means for selectively making electrical connections between said members at their intersectional points according to a schedule of allotments of spacing among the characters of the two cases, a series of common terminals representing the spacings for one case of characters, circuit closing means operable to connect said common terminals to either of said groups of said first series of contact members, and individual contact making devices representing the characters of a single case for selectively closing circuits to said second series of contact members.

12. A switching mechanism for a variable spacing typewriter comprising two parallel spaced contact assemblies, one of said assemblies having a series of longitudinal contact members corresponding to a series of different character spacings, the other of said contact assemblies having a series of transverse contact members representing characters, one of said assemblies having means to establish electrical connections selectively between said longitudinal and transverse contact members; circuit closing means including a series of switch elements, one for each character, each engageable with one of the transverse contact members to close circuits to said members selectively; and means to mount said assemblies enabling the ready removal of the one having the means to establish electrical connections.

13. A switching mechanism for a variable spacing typewriter comprising two parallel spaced contact assemblies, one of said assemblies having a series of longitudinal contact members corresponding to a series of different character spacings, the other of said contact assemblies having a series of transverse contact members representing characters, one of said assemblies having means to establish electrical connections selectively between said longitudinal and transverse contact members; circuit closing means including a series of switch elements, one for each character, each engageable with one of the transverse contact members to close circuits to said members selectively, the second assembly being disposed loosely between the first assembly and the circuit closing means; and means to mount the first assembly for movement to a position permitting free removal of the second assembly.

14. A switching mechanism for a variable spac-

ing typewriter comprising two parallel spaced contact assemblies, one of said assemblies having a series of longitudinal contact members corresponding to a series of different character spacings, the other of said contact assemblies having a series of transverse contact members representing characters, one of said assemblies having means to establish electrical connections selectively between said longitudinal and transverse contact members; circuit closing means including a series of switch elements, one for each transverse contact member; a housing for said assemblies and circuit closing means including a pair of channel-shaped frame members, one of which is fixedly mounted and the other of which is pivotally connected to enable one of said frame members to be swung out of the way, one of said frame members mounting the first contact assembly and the other frame member mounting the circuit closing means with the switch elements cooperating with said transverse contact members, said second assembly being loosely received between said first assembly and the circuit closing means so as to be freely removable when said housing is opened by moving the pivotally connected frame member to one side; and releasable means to hold said housing closed.

15. A switching mechanism for a variable spacing typewriter comprising two parallel spaced contact assemblies, one of said assemblies having a series of longitudinal contact members corresponding to a series of different character spacings, the other of said contact assemblies having a series of transverse contact members representing characters, one of said assemblies having means to establish electrical connections selectively between said longitudinal and transverse contact members; circuit closing means including a series of switch elements, one for each transverse contact member; a housing including a pair of separable housing elements for said assemblies and said circuit closing means, at least one of the contact assemblies being loosely received between said housing elements to permit substitution of a different assembly having a different selective effect; and means for releasably separably connecting said housing elements.

16. In a switching mechanism for typographical machines having space selecting means and having a series of electrical actuating devices for the selecting means representing spacings, a selective contact making device comprising three parallel bars of insulating material, one of the outer bars having a series of longitudinal contact strips having connections to said devices, the other outer bar having a series of common contact strips representing characters and disposed transversely of the first strips in planes intersecting the first strips, the intermediate bar having apertures co-axial with the lines of intersection of the planes containing both kinds of contact strips, and contact making elements in said apertures and establishing different space selecting current paths from the second set of strips to the electrical actuating devices, said transverse strips having contact lugs selectively disposed along the edges of the transverse strips and engaging selected ones of said contact making elements.

17. In a switching mechanism for typographical machines having space selecting means and having a series of electrical actuating devices for the selecting means and representing spacings, a selective contact making device comprising three parallel bars of insulating material, one of

the outer bars having a series of longitudinal contact strips having connections to said devices, the other bar having a series of common contact strips representing characters and disposed transversely of the first strips in planes intersecting the first strips, the intermediate bar having transverse rows of apertures co-axial with the lines of intersection of the planes containing both kinds of contact strips, and contact making elements in said apertures and establishing different space selecting current paths from the second set of strips to the electrical actuating devices, said contact making elements being loosely selectively disposed in pre-selected apertures of the transverse rows to represent character spacings.

18. In a variable spacing typewriter, a series of character selecting elements for a font containing both upper and lower case characters, each selecting element representing at least two characters; a series of rows of contact elements, one row for each character selecting element, the contacts of each row being divided into two groups of contact elements, one group representing different possible spacings of upper case characters and the other group representing the possible spacings of lower case characters; a series of common contact members, each common contact member corresponding to a character and its selecting element and making electrical contact with predetermined contact elements to determine a spacing selection for both the upper and lower case characters represented by such common contact member; a series of electrical space selecting elements representing different spacings of both upper and lower

case characters, contact means controlled by the character selecting elements for closing circuits to said common contact members, and case selecting means including a switching device for connecting the space selecting elements to one or the other of said groups of contact elements in common.

19. In a switching mechanism for typographical machines having space selecting means and a series of electrical actuating devices for the selecting means representing spacings, a selective contact making device comprising three parallel bars of insulating material, one of the outer bars having a series of longitudinal contact strips having connections to said devices, the other outer bar having a series of common contact strips representing characters and disposed transversely of the first strips in planes intersecting the first strips, the intermediate bar having apertures co-axial with the lines of intersection of the planes containing both kinds of contact strips, and contact making elements in said apertures and establishing different space selecting current paths from the second set of strips to the electrical actuating devices.

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