

Oct. 7, 1947.

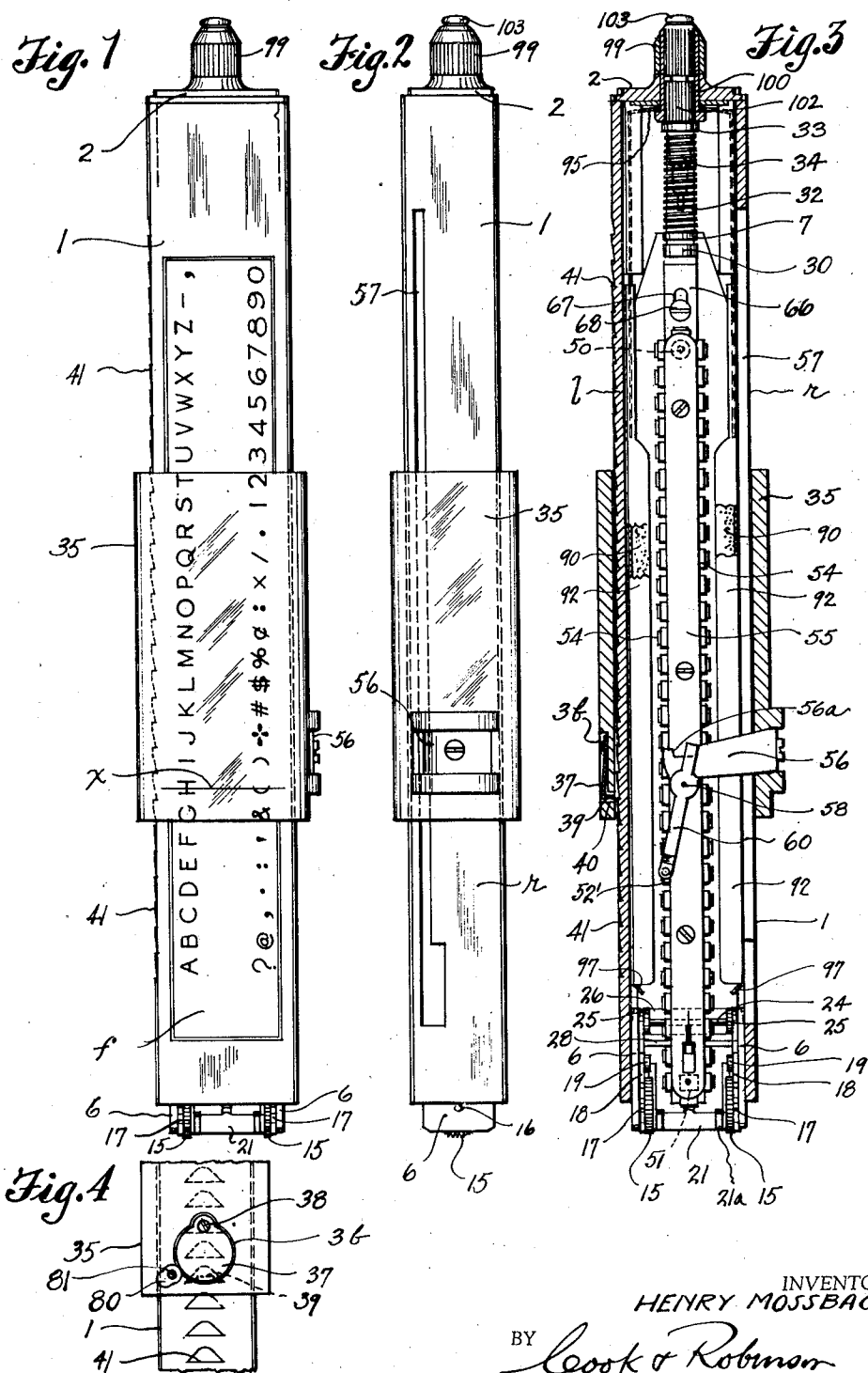
H. MOSSBACH

2,428,378

WRITING DEVICE

Filed Jan. 26, 1945

5 Sheets-Sheet 1



Oct. 7, 1947.

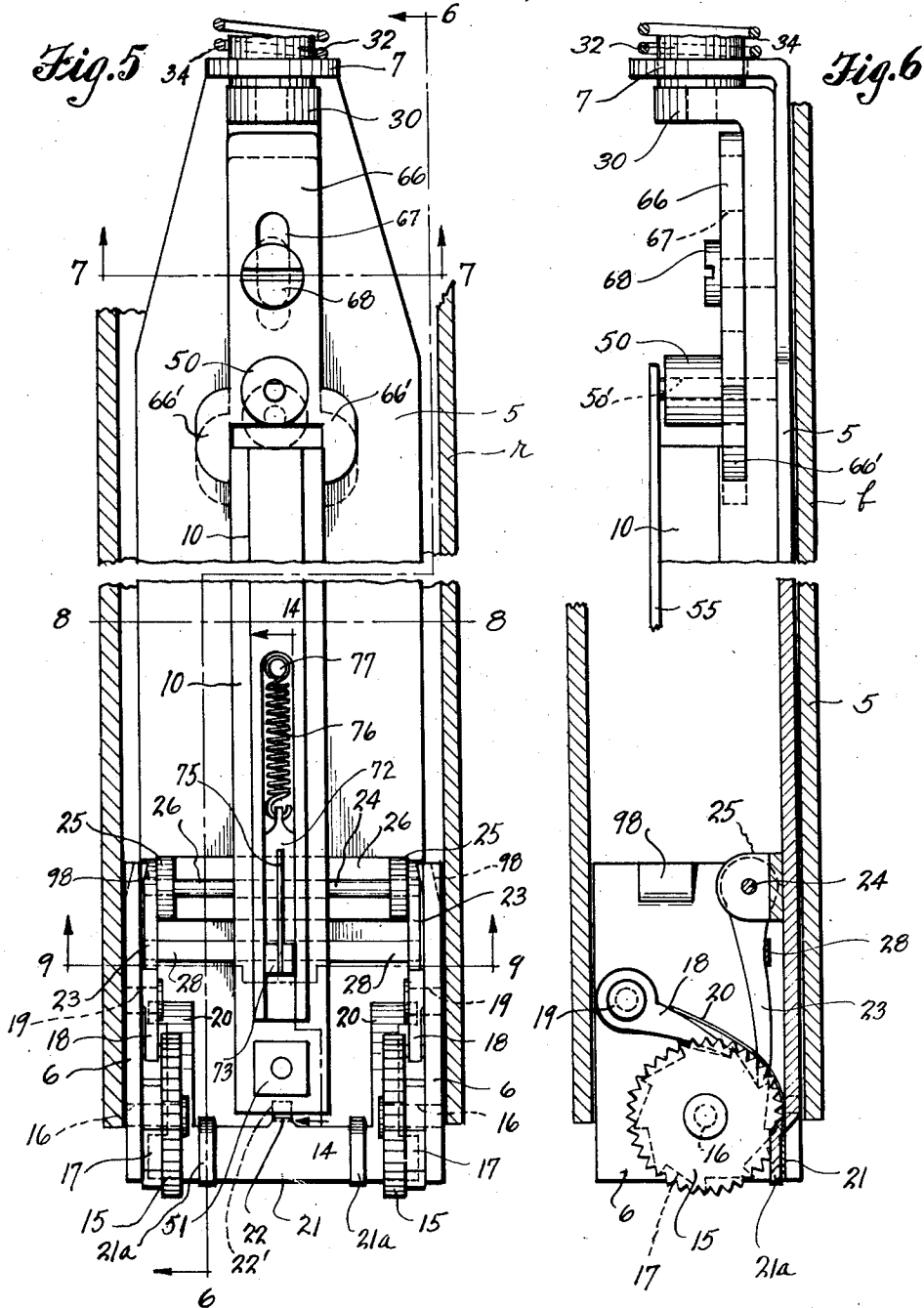
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5 Sheets-Sheet 2



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Filed Jan. 26, 1945

5 Sheets-Sheet 3

Fig. 10

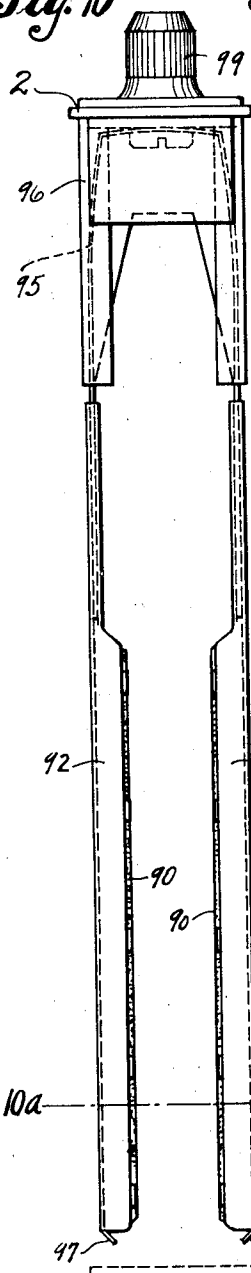


Fig. 11

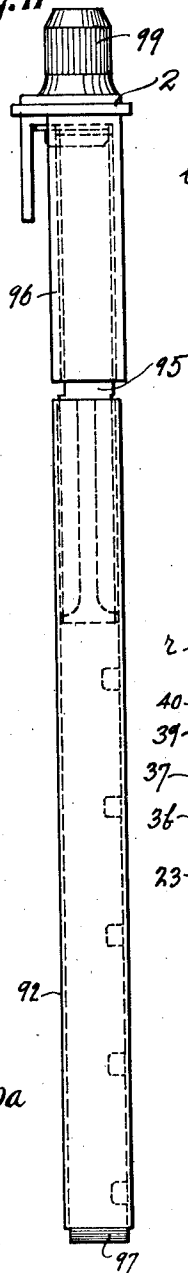


Fig. 7

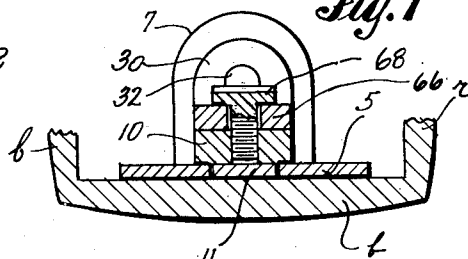


Fig. 8

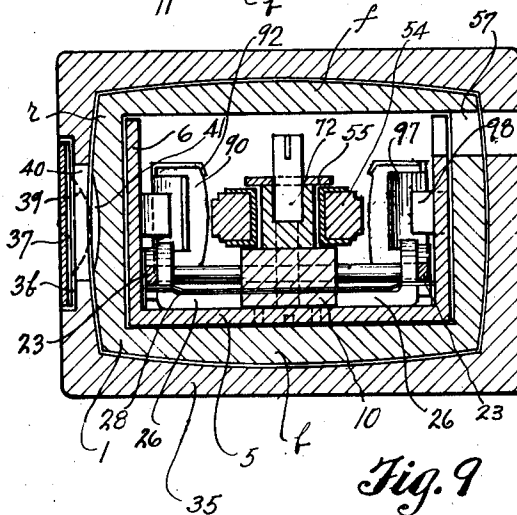
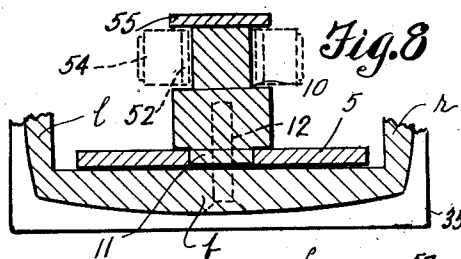


Fig. 9

10a

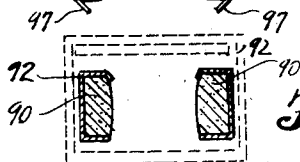


Fig. 10a

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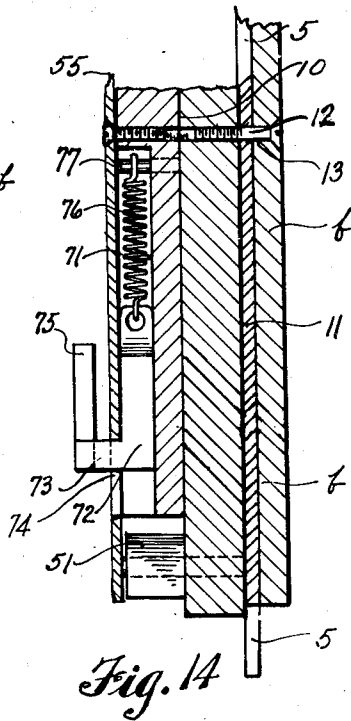
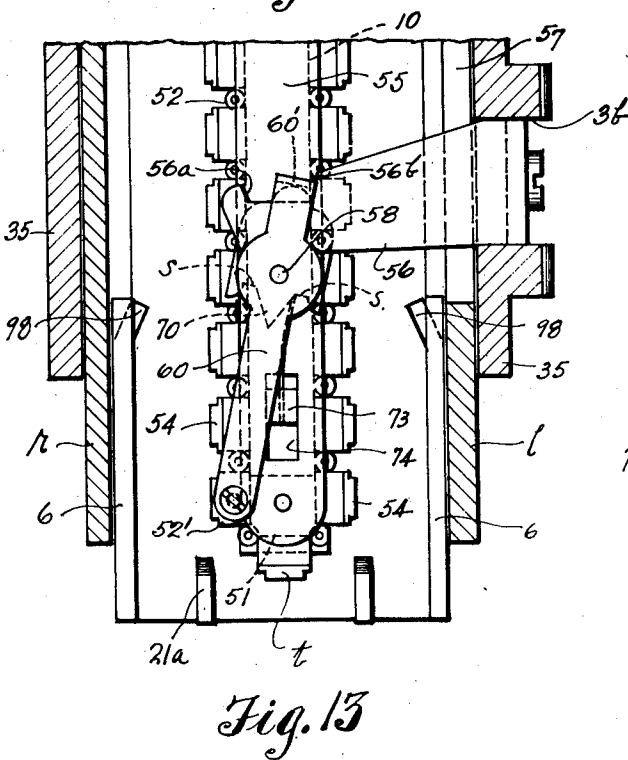
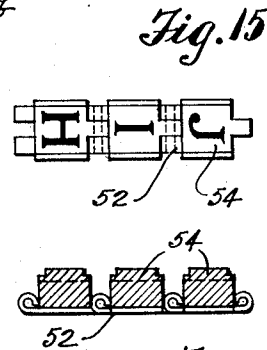
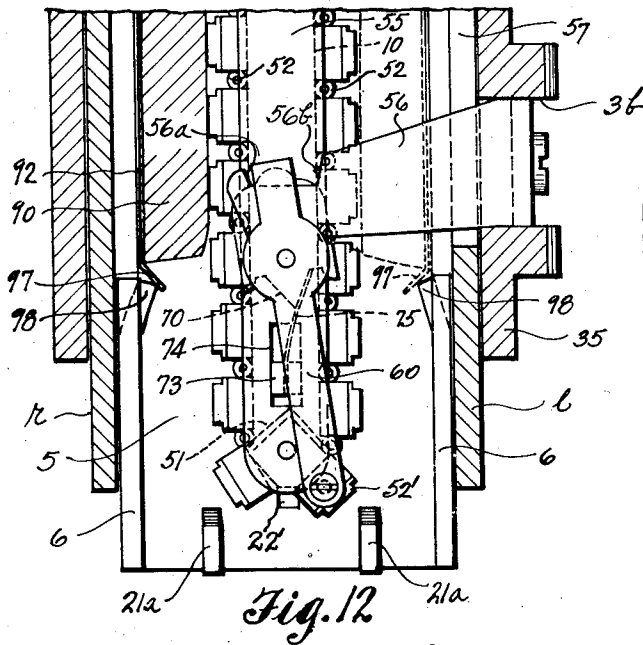
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5 Sheets-Sheet 4



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2,428,378

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Fig. 17

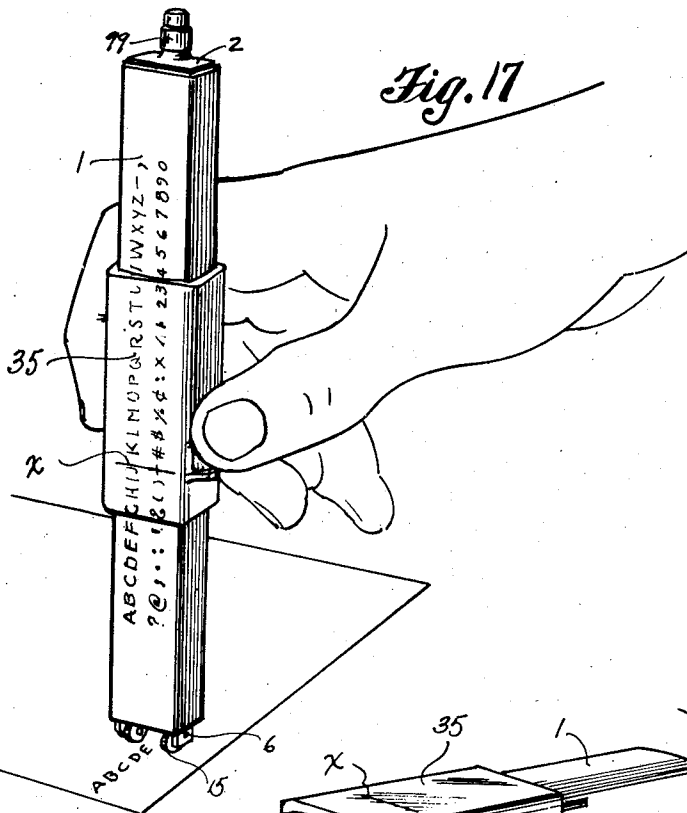
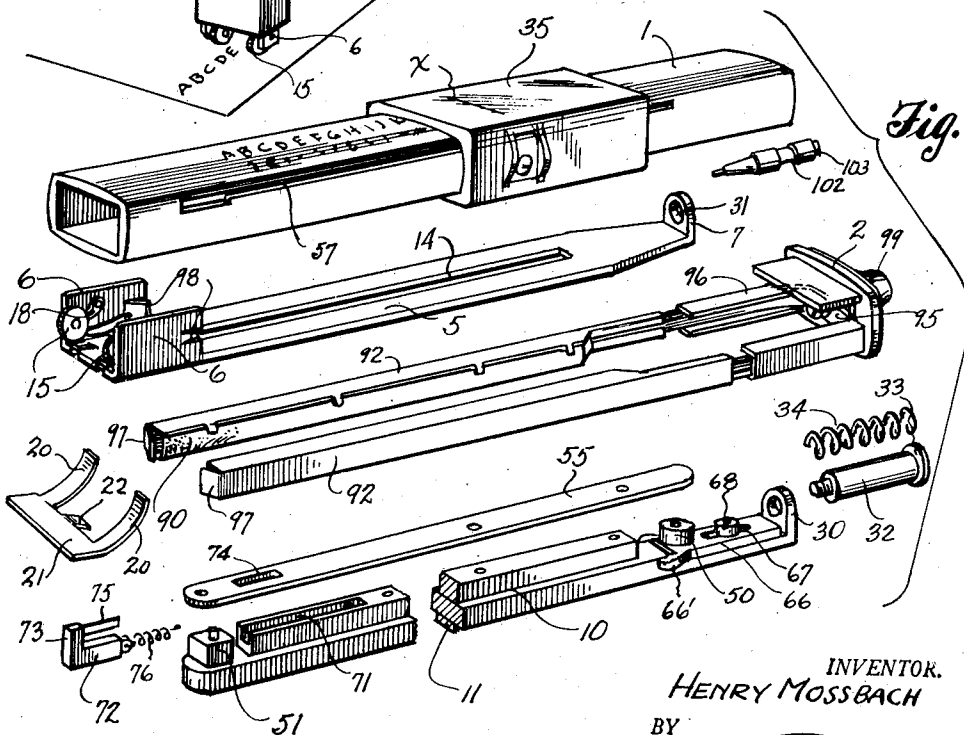


Fig. 18



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UNITED STATES PATENT OFFICE

2,428,378

WRITING DEVICE

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Application January 26, 1945, Serial No. 574,744

13 Claims. (Cl. 197—2)

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This invention relates to printing and writing devices, and it has reference more particularly to hand operated devices for the selective printing, by means of inked type, of characters such as letters of the alphabet, numerals and various other signs or symbols as now generally used in typewriters to produce intelligible writing.

It is the principal object of this invention to provide a small, hand operated device of the above character, adapted to be held for use in one hand, much in the manner of holding a pencil in writing, and whereby individual selection of any one of the provided type characters may be easily and quickly made and the selected character printed on a printing surface.

It is also an object of the invention to provide novel means whereby, in the printing of words or any succession of characters, an automatic spacing is effected incident to the printing operation.

More specifically stated, the objects of the present invention reside in the provision of a writing or printing device of the character above stated, comprising a tubular outer case, which contains therein the character printing mechanism, including a movable type carrying belt, and on which case, designations of all the characters that may be printed are marked in columns for purpose of selection of type in a printing operation; also, there being a character selector sleeve adjustably fitted on the case for movement therealong, having an indexing line thereon for registration with any desired character designation in the columns, thereby to effect movement of the type carrying belt to bring the corresponding type into position for its being printed; also, the selector means being equipped with a yielding latch mechanism, designed to be depressed by a finger of the hand in which the device is held, after a character selection has been made, thereby to cause the selector to be temporarily locked to the case and an operating connection made whereby the printing of the selected character on a writing surface may be completed.

It is also an object of this invention to provide a printing or typewriting device of the character above stated, having a pair of small wheels at its lower end for frictional rolling contact with the writing surface, and which wheels are operable through a novel indexing means, to guide the device in its direction of advancement or travel across the surface, both for the purpose of maintaining the desired alinement of printed characters, and to effect the proper indexing or spacing of characters in the writing of words or in the printing of numerals.

Another object of the invention is to provide type inking means within the device whereby the type characters will be retained adequately inked for printing.

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Another object of the invention is to provide a printing device of the character and for the purpose above stated, wherein the parts reset themselves after each printing operation in readiness for the next character selection and printing operation.

Another object of the invention is to provide novel means for effecting an operating connection between the selector sleeve and type carrying belt whereby all type characters on the belt can be brought individually into printing position by a movement of the selector sleeve within a distance that is approximately one-half the length of the belt.

Still another object of the invention is to provide a writing or printing device for the purposes and of the character above stated that is relatively simple in construction; that is easy to assemble or disassemble for repair or replacement of parts; that is light in weight, compact, easy to use and effective and efficient for its intended purposes.

Further objects of the invention are to be found in the relationship of parts embodied in the device, and in their details of construction and combination, as will hereinafter be fully described.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is a front, or face view of a writer or printing device embodied by the present invention.

Fig. 2 is the right-hand side view of the same.

Fig. 3 is a view of the device, showing the outer case and the character selector sleeve in longitudinal section for better illustration of the type carrier belt and the means connecting the belt with the selector sleeve.

Fig. 4 is a fragmental detail of a part of the movable character selector sleeve, and a part of the case, illustrating the yieldable latch pawl whereby an operating interlock may be effected between the sleeve and the case preparatory to the moving of a selected type into printing contact with a writing surface.

Fig. 5 is an enlarged, face view of the type carrier bar and indexing frame, or what, for better understanding and explanation is hereinafter termed the "stationary carriage"; a medial portion of these parts being broken away to permit reducing the length of the view.

Fig. 6 is a longitudinal, sectional view of the same parts taken on line 6—6 in Fig. 5.

Fig. 7 is a cross sectional detail, taken on line 7—7 in Fig. 5.

Fig. 8 is a cross sectional detail, taken on line 8—8 in Fig. 5.

Fig. 9 is an enlarged cross sectional view taken

through the case, the selector sleeve and the stationary carriage, at a location corresponding to that of line 9—9 in Fig. 5.

Fig. 10 is a front view of the ink pad carriers or what is herein called the type inking unit.

Fig. 10a is a cross sectional view taken on line 10a—10a in Fig. 10.

Fig. 11 is a side view of the type inking unit as seen in Fig. 10.

Fig. 12 is an enlarged elevation, with parts of the case and character selector sleeve in section, showing a part of the type carrying belt and the means connecting the selector with the belt for its movement; particularly showing the carry-over lever and its actuating means.

Fig. 13 is a similar view illustrating the function of the carry-over mechanism.

Fig. 14 is a longitudinal section taken on line 14—14 in Fig. 5, showing a part of the belt mounting bar and the trip spring of the carry-over mechanism.

Fig. 15 is a face view of a short length of the type belt, showing the arrangement of type on links of the belt.

Fig. 16 is a longitudinal section of a portion of the type carrying belt.

Fig. 17 is a perspective view of the present printing device as held in the hand for use.

Fig. 18 is a perspective view of various parts of the device shown in disassembled relationship for purpose of description and better understanding.

Briefly described, the present device comprises an outside case of tubular form, about which a relatively short character selector sleeve is fitted for easy sliding movement therealong. On its front face, the case has two character columns formed therealong, one column comprising the letters of the alphabet, in regular order and evenly spaced, and the other column comprising numerals, symbols and marks other than letters, corresponding to those generally used on the keyboard of a typewriter. The two columns of characters are parallel and coextensive, as seen best in Fig. 1.

Within the case is the carriage or indexing frame, heretofore referred to as the stationary carriage, which, at its lower end projects slightly from the open lower end of the case, and there it mounts two wheels that engage the writing surface and are adapted to be turned in unison to guide the device in a straight line across the writing surface as the writing progresses, thus to aline the printed characters and, by an indexing means which accurately measures the extent of rotation with each printing operation, to effect the proper spacing of successively printed characters.

Also contained in and fixed to the case, and slidable along the stationary carriage, is a longitudinal bar equipped with means at upper and lower ends thereof for the support of a continuous, traveling link belt on which the printing type, represented by the letters and characters on the front face of the case, are mounted.

The character selector sleeve has a novel operating connection with the belt, and this connection is such that when the character selector sleeve is moved along the case to register an indexing mark thereon with any selected character on the case, the belt is moved accordingly to locate the corresponding type in position for printing. Also, there is a latch, or pawl mounted on the selector sleeve that, after a character selection has been made, may be pressed by a finger of the hand in

which the selector sleeve is grasped, into holding contact with a ratchet surface on the case to thereby lock the sleeve relative to the case, and thus provide that, upon applying downward pressure through the sleeve, the case will be moved downwardly along the stationary carriage, and this downward movement of the case moves the belt carrying bar downwardly and, through a pawl and ratchet connection with the indexing and guide wheels, actuates the wheels to advance the device a distance for proper spacing of characters, and then, in the final downward movement of the case, and after spacing has been completed, presses the selected type into contact with the printing surface to print its character thereon.

Release of downward pressure against the selector sleeve permits the sleeve and selector to be lifted back to normal position, and the latch is then released for another character selection by movement of the selector sleeve along the case.

Referring more in detail to the drawings—

The housing, or case of the present device, is designated by reference numeral 1, and it is preferably formed of metal or plastic, in continuous tubular form, rectangular in cross section and open at its ends. The open upper end is normally closed by a removable cap-like member 2 which is part of the removable type inking unit which subsequently will be fully described.

In order to facilitate identification of various parts of the case, that wall thereof which is considered to be the front by reason of its having the character columns formed thereon, will be referred to as the "face" or "front wall" of the case. The wall that is directly opposite the front wall will be referred to as the "back wall," and the other walls will be referred to as the "side walls." The front wall is designated by character *f*, the back wall by character *b* and the opposite side walls, respectively, by characters *r* and *l*.

Contained within the case, lengthwise thereof, and providing for a limited slidable movement of the case lengthwise thereon, is the stationary carriage frame. This frame has been referred to as the "stationary carriage" because in the operation of printing, it rests at its lower end against the printing surface and operates as a carriage for the case which moves upwardly and downwardly thereon in the selection and printing of characters. This stationary carriage comprises a flat, bar-like strip of metal 5 that is disposed flatly against the inside surface of the wall *b* of the case, as shown in Figs. 6 and 9, and it extends substantially the full length of the case.

The lower end of the bar 5 normally projects just slightly from the open lower end of the case and it is formed at that end, along its opposite side edges, with parallel flanges 6 and 6 turned forwardly at a right angle to the plane of the bar. These flanges lie closely adjacent the corresponding side walls *r* and *l* of the case, as observed best in Figs. 3 and 9.

At its upper end, the bar 5 is somewhat tapered and terminates in an out-turned flange 7 that is located in the central longitudinal line of the case.

The bar 5 is held properly in place in the case by means of the type belt supporting and guide bar 10. This bar has been shown in face view in Fig. 5 and in cross section in Figs. 8 and 9 as being affixed lengthwise within the case as a retainer and guide for the bar 5. It is fixed to the back wall *b* in the central longitudinal line of the case, and it will be observed by reference to Fig. 18, that the bar 10 is there shown as being made up of three

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strips of metal which form a relatively wide central body portion, and narrower strips fixed thereto along top and bottom sides. However, this bar may be made as a single integral piece, shaped as indicated in the illustration of bar 10 in Fig. 18.

The bar 10, as seen in the various views, is formed on its under side with a longitudinal, central rib 11 that engages the case wall b and supports the main body portion of the bar somewhat spaced from that wall. A plurality of screws 12 are passed through openings 13 in the wall and are threaded into the bar 10 to secure it solidly to the case, as shown in Fig. 14.

The bar 5 is formed with a central longitudinally extending slot 14, as noted in Fig. 18, and this receives the rib 11 therein as a guide for the relative longitudinal movement of the case on the bar 5; this movement being limited by the length of the slot in the bar to a relatively short movement required for the printing and indexing operation.

By reference to Figs. 7 and 8, it will be understood that the opposite longitudinal edge portions of the body of bar 10 overlap the bar 5 along the opposite sides of slot 14 and in this way, the bar 5 is held in place but is left free for the intended relative movement of bar and case.

The bar 10 supports the type carrying belt thereon, as will presently be fully described, and therefore it will be understood that, with the lower end of the stationary frame engaged with a printing surface as in Fig. 17, the downward movement of the case from its normal lifted position, along the stationary frame member 5, moves the bar 10 accordingly and in this way moves a selected type into printing contact with the printing surface. This will presently be more fully described.

Mounted in spaced and transversely aligned relationship, just within the opposite side flanges 6—6 at the lower end of the bar 5, are the paired indexing and guide wheels 15—15. These wheels are of the same size, and each is revolvably mounted on a short stud 16 that is fixed in the corresponding flange 6. A peripheral portion of each wheel projects slightly below the flanged end of the bar 5 and this normally extends slightly from the lower open end of the case, as shown in Figs. 1 and 2. Thus, in the use of the device, the wheels are adapted to engage in rolling contact with the writing surface.

To insure proper holding traction of these wheels with the writing surface, it is desirable that the periphery of each roller be sharply corrugated or knurled as shown best in Fig. 6.

Fixed to the outer face of each wheel, concentric thereof, to serve as a means for effecting its turning advancement, is a ratchet wheel 17, see Figs. 5 and 6, and each indexing wheel is prevented from reverse turning by a pawl 18 that is pivoted on the corresponding flange 6 by a stud 19 and is held yieldingly in contact with the ratchet by a spring arm 20 that presses downwardly thereagainst. The spring arms 20 are formed at the opposite ends of a metal clip 21 that is removably applied to the lower end of bar 5, as seen in Figs. 5 and 6, and held in place by a tongue 22 that extends from its top edge and is bent into a hole 22' in the lower end of bar 5 as shown in Fig. 5. The clip is held in place beneath two tongues 21a that are outwardly struck from the lower edge portion of plate 5; this also being shown in Figs. 5 and 6.

The wheels 15—15 are rotatably advanced in unison and to the same extent, with the initial

downward action of the case and type carrying means along the stationary carriage to thereby effect the proper indexing or spacing of printed characters before printing takes place. The actual printing is effected by the final downward movement of the case, as presently explained. The rotary advancement of the indexing wheels is effected by a pair of pawls 23 that are arranged to engage the ratchet wheels 17—17 when the case is moved downwardly. These are pivotally supported at the opposite ends of a cross shaft 24 that, in turn, is carried by a pair of upturned wings 25—25 at the ends of arms 26—26 extended laterally in opposite directions from the lower end of bar 10. The pawls 23 will so engage the ratchet wheels 17 that when the case 1 is moved downwardly along bar 5, they will simultaneously rotate the wheels 15 to the same extent, thus to cause straight indexing travel of the case along the printing surface against which they rest. Also, since the downward shifting of the case is to the same extent for each printing operation, the wheels effect an exact spacing of characters. The pawls 23 are held yieldingly against the ratchet wheels by spring arms 28 that are fixed to the lower end of bar 10, as seen in Figs. 5 and 6.

At its upper end, the bar 10 terminates in a forwardly turned lug 30 that is located just below the out-turned flange 7 at the upper end of bar 5. Fixed in the lug 30 and extending freely through a hole 31 in flange 7, is a tubular stud 32. This is formed at its upper end with an annular flange 33, and applied about this stud is a coiled spring 34 that bears against the flange 33 and against the flange 7 to yieldingly support the case at its upper limit relative to the stationary frame bar 5, or, in other words, this spring serves to urge the stationary carriage downwardly in the case to the slightly extended position in which it is shown in Figs. 1, 2 and 3.

The character selector sleeve 35 is well shown in Fig. 17, and for most practical use, is of a transparent material in order that the character designations on the case can be seen therethrough. It has a line x marked thereon, known as the indexing line, and this is used in making character selections for printing. Set within the recess 36 formed in one side of the sleeve at a location that will be beneath the index finger of the hand in which the device is held for use, is a yieldable pawl or plate 37 fixed in place at one edge by a screw 38 as noted in Fig. 4, and at the opposite edge of the plate (see Fig. 3), is a downwardly turned tooth 39 that projects into an opening 40 in the sleeve. Formed in the underlying side wall of the case, substantially to its full length, is a ratchet toothed surface comprising the upwardly faced teeth 41. Whenever the selector sleeve line x is registered with a character designation on the case, and the pawl is pressed inwardly, it will effect an interlock with the case and thereby provide that by a downward application of pressure on the sleeve by the hand holding device in normal use as in Fig. 17, the case will be moved downwardly along the stationary carriage frame bar 5. This movement is slight but the initial downward movement causes the pawl 23 to engage the ratchet wheels 17 to rotate the wheels 15 to advance the device for the indexing or spacing of the character that is to be printed from that last printed. Then, after indexing, the final downward action of the case effects the direct printing of the selected char-

acters on the printing surface, as presently explained.

Supported on the bar 10, at upper and lower ends thereof, are pulley wheels 50 and 51, and mounted for travel thereover is an endless link belt. This belt is made up of a succession of identical, pivotally connected links 52 as shown in Figs. 12 and 15, and on each link, with one exception, is a type 54 for printing a certain character, and these types are individually represented by the characters on the face of the case. One link of the belt mounts a blank lug to which the belt operating means is connected, as later explained.

The belt carrying pulley 51 at the lower end of bar 10 has four flat faces, as seen in Fig. 5, and each face is of the same length as a belt link, as shown in Fig. 13, and the links in passing thereover, flatly engage these surfaces.

The type belt extends along opposite sides of bar 10 and there is a flat bar or plate 55 fixed to the top side of bar 10, and this overlies the two longitudinal runs of the belt as shown best in Figs. 3 and 9.

The cross sectional view, Fig. 9, shows the two runs of the type belt as being contained for travel in laterally opening channels that are formed along opposite sides of the bar 10 by the application of plate 55 to the top side of the bar. Removal of plate 55 permits removal of the type belt.

Fixed rigidly to the selector sleeve 35, as shown in Fig. 3, is an arm 56 that extends into the case through a slot 57 formed lengthwise in the side wall *r* thereof. The inner end of the arm 56 overlies the bar 10 and the type belt, and at that end is pivotally connected, as at 58, with one end of a link 60. The link 60 has a limited oscillating action, and at its lower end is pivotally fastened to the blank type lug 52' of the type belt. Thus, it will be understood that, when the sleeve 35 is moved along the case to register its indexing mark *x* with the different character designations, the belt will be caused to travel about its supporting pulleys 50 and 51 and, by this travel, any desired type may be brought into printing position; that is, seated against the downwardly directed flat surface of the pulley 51.

It will here be explained that the type on the belt are arranged in the same printing order as are the type character designations in the two columns on the case, and that the point of connection of link 60 with the blank type lug 52' of the type belt is between those links which carry the type for character A and that for the question mark. Or, should any other arrangement of characters be made, the connection with the type belt is always between the type characters thereon that are represented by the characters that are at the lower ends of the character columns on the case.

It is to be observed by reference to Figs. 12 and 13 that the upper end of link 60 extends somewhat above the pivot point 58, and there has an inturned end 60' adapted to engage limit shoulders 56a and 56b to definitely limit the extent of its oscillating action. This limit of movement prevents the moving force that is applied to the type belt in moving the selector downwardly, from forcing the belt outwardly against the inking pads, presently to be described.

Also, the lower end terminal edge of the slot 57 is accurately determined so that when the arm 56 is brought against it, the belt moving pressure is removed from the link 60 and it is free

to be actuated across the dead center position in making a changeover operation.

Assuming that the connecting link 60 is disposed in the angular position in which it is shown in Fig. 3 or in Fig. 13, the adjustment of the sleeve 35 along the case through the length of that column containing the letter designating characters will successively bring each one of the letter printing types into printing position at the lower end of the bar 10 and flatly against a face of pulley wheel 51 as is that particular type designated at *t* in Fig. 13. However, should it be desired to print from any of those type represented by the characters of the right-hand column, as shown in Fig. 1, it is necessary that the angular position of link 60 be changed from that in which it is shown in Fig. 13 to that of Fig. 12. This changeover operation, from one side to the other, becomes necessary each time it is desired to print a character that is represented in a different column from that last printed. For example, to write "H2" would require first moving the selector sleeve 35 along the case for registering the indexing line X with the character designation "H" in the letter column on the case, then printing the letter, then adjusting the selector sleeve to its downward limit of travel on the case, then moving it upwardly to register the indexing line X with the numeral 2 on the case, then printing the numeral. Each time the character selector sleeve is moved to its limit of travel downwardly, the angular direction of link 60 is changed from one side to the other, and this changeover is effected by means now to be described.

Fixed to the under side of the link 60, just below its point of pivotal connection with the inner end of arm 56, is a V-shaped tooth 70. This tooth is symmetrically disposed relative to the longitudinal line of the link 60 and is pointed downwardly, as shown in Figs. 12 and 13.

Mounted in a longitudinal groove 71 formed in the top side of the lower end portion of the bar 10, as seen in Fig. 14, is a block 72 in which the lower end of a stud 73 is fixed. This stud extends upwardly through a slot 74 in the belt retainer strip 55. Fixed on the post is one end of a spring-like prong 75 that extends along the top side of the belt cover plate, as shown in Figs. 12 and 14, and is in such position that it will engage with that inclined face of the tooth 70 that is most nearly downwardly directed when the selector sleeve is shifted to its lower limit.

Assuming that the link 60 and tooth 70 are inclined as in Fig. 13, and are moved to the lower limit of travel, the upper end of the prong 75 first engages the inclined, right-hand side surface of the tooth 70 and slides therealong, up to and then abuts a downwardly facing shoulder S at the base of the tooth, as shown in Fig. 13. The sleeve has not yet reached its limit of downward travel; therefore farther downward travel of the selector sleeve causes the prong to exert an eccentric pressure against the tooth and by that pressure to urge the lower end of link 60 toward the side of eccentric pressure in a manner whereby to carry it across the dead center position between that in which the lever is shown in Figs. 13 and 12, and move it to the position of inclination in which it is shown in Fig. 12. Then, when the selector sleeve is adjusted upward along the case, the type that are represented by the characters in the column at the right-hand side of the case in Fig. 1 will be successively brought into printing position.

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The same carry-over action takes place when the selector sleeve is moved to its downward limit after printing of a numeral or symbol represented in the right hand column.

The upper pulley 50 which supports the type belt, is mounted on a pivot pin 50' fixed in a slide plate 66. The plate 66, as noted in Fig. 6, is set in a recessed part of the bar 10 and is formed with a longitudinal slot 67 through which a set screw 68 is passed and threaded into the bar 10. By this means, slack in the type belt may be taken up as and if required. To hold the plate 66 in place, it is equipped at one end with guide wings 66' which slidably engage with opposite sides of the end portion of bar 10. These wings are best shown in Figs. 5 and 6.

It will be noted more particularly by reference to Fig. 14, that the post 73 which mounts the spring prong 75 is integral with the slide 72 that is fitted for movement in the groove 71 formed longitudinally in the lower end of the bar 10. A coiled spring 76 is anchored at one end to a stud 77 in the bar, and at its other end to the slide to permit of a certain downward yielding, or travel of the slide after the prong has engaged a base shoulder of the tooth 79. This spring yields with the final downward movement of the selector sleeve, but retains a definite pressure on the tooth base that will operate to carry the lower end of the lever 60 across the dead center line when the final downward adjustment of the selector sleeve is reached.

Note is to be taken that the link of the type belt that mounts the type that is selected for printing will, at the time of printing, be flatly disposed against a flat downwardly facing surface of the wheel 51 at the lower end of bar 10. Thus, printing pressure applied through pressure on the bar, will have no tendency to turn the pulley wheel 51.

A character selection is made by registering the line X of the selector sleeve with the character designation on the case. Then, the sleeve is locked, by depression of the latch pawl 37 with the case. During the printing operation, this interlock is maintained, but as soon as one character printing operation has been completed, the user merely releases his down pressure on the sleeve, and the spring 34 immediately restores the case and stationary carriage to their normal, or starting positions, with the type free and clear of the writing surface. Holding pressure on the latch pawl is not removed until after the case has been lifted. This prevents the spring action from causing the device to have any tendency to jump from the paper. The device is not lifted from the surface during the printing of words or sentences; therefore, the knurled surfaces of the indexing wheels 15 keep it in alinement. Care is taken not to move the device from the upright position shown in Fig. 17 in making a character selection, in order to get best printing results.

When the device is not in use, and, for example, is being carried in the pocket, it is desirable that the selector sleeve be locked against movement. This is effected by a locking button 80, shown in Fig. 4, that is fixed by a stud 81 to the sleeve 35 adjacent the latch 37. By depressing this latch, and rotating the button, an edge portion thereof may be located over the latch edge to hold it depressed.

In order that the type may be kept in an adequately inked condition for printing, I have provided two elongated inking pads 90—90 that are supported lengthwise of the two runs of the type

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belt as is shown in Fig. 3. Each pad is held in a metal frame 92 of trough-like character facing the belt, and each trough is supported in place by attachment at its upper end to a rather elongated leg portion of an inverted U-shaped yoke 95 that is fixed to the under side of the previously mentioned plate 2. Enclosing the upper portion of this yoke, and also fixed to the under side of the plate, to fit frictionally in the upper end of the case 1, is a housing 95 that serves as a sort of guide for the legs of the yoke.

The yoke 95 is made from a spring metal strip and its leg portions to which the ink pad frames are secured, normally hold the pads disengaged from the type; however, at the lower end of each of the pad holding frames 92, is an inclined wing 97 and these wings are adapted to be engaged with inwardly pressed ears 98 on the flange 6—6, each time the case is moved downwardly along the bar 5, to thereby cause the frames to be moved inwardly and momentarily into inking contact with all type faces. This takes place with each printing operation and is sufficient to keep all type adequately inked at all times. The inking unit may be bodily withdrawn from the upper end of the case for recharging the pads with ink should this be necessary.

For easy withdrawal of this unit, I have affixed a knurled nut or button 99 to the cap 2. This nut is held in place, being threaded onto a tubular stud 100 that extends through plate 2. The stud serves primarily as the means for affixing the yoke 95 and housing 96 to the cap plate 2, as seen in Fig. 3.

Mention will here be made that, due to the fact that the ink pads must be disposed in a certain position in the case, the open end of the case 1 which receives the frame 96, is so designed that the case can not be inserted except in the correct manner. This insures against inserting the ink pad frames in inverted position.

Mounted in the tubular stud is a removable pencil 102 equipped with eraser 103.

While I have shown the actual printing to be effected by means of type that are affixed to a continuous chain belt operating over the pulleys 50 and 51, it is now anticipated that in lieu of the belt, a wheel might be mounted to revolve on a pivot corresponding to the pulley wheel 51, that the type be mounted on the periphery of this wheel, and that the selection of the type be made by means corresponding to that already described, but which is connected by a flexible belt or linkage to cause rotation of the wheel with the upward and downward travel of the selector sleeve.

Assuming the various parts of the device to be constructed as described and assembled in the manner illustrated, the use of the device, briefly, is as follows:

It is held in the hand and applied to the writing surface in the manner illustrated by Fig. 17. The character selection is then made by moving the selector sleeve 35 along the case to bring the line X thereon into registration with the desired character. Then the latch pawl 37 is depressed to lock the sleeve against movement along the case. Then a downward application of pressure is applied to the sleeve, thereby to move the case downwardly. With the initial downward movement of the case, the indexing wheels advance the device one space along the writing surface. The final downward movement of the case moves the selected type into contact with the surface and effects the printing operation.

Downward pressure against the case is then relieved and the spring 34 operates to lift the case and sleeve back to starting position. Then holding pressure on the latch 37 is released and this frees the selector sleeve for travel in making the next character selection.

With each downward application of force on the case, the ink pad frames are pressed momentarily into contact with the type along opposite sides of the bar 10, and this is sufficient to keep them adequately inked, assuming of course that the same character is not being repeatedly printed. If such should be the case, it is required that the type be inked periodically.

It will here be mentioned that it is desirable that before a printing operation, a trial of the device should be made to ascertain whether or not the device is set on the letter printing column or on the numeral printing column. This can be ascertained by printing one character. If it is found that the device is not set as desired, then it is properly set by moving the selector sleeve 35 completely to the lower end of its travel and then lifting it back to the character to be selected.

Devices of this character are to be made in a size convenient for carrying in the vest pocket, but might be made in larger sizes if desired.

I claim:

1. A printing device of the character described comprising a vertical carriage member, indexing wheels mounted on the lower end of the carriage member to engage in rolling contact directly against a surface to be printed upon, a case mounted on the carriage member for limited up and down movement thereon, yieldable means normally supporting the case at its upper limit of movement on the carriage member, a type carrier element adjustably mounted on the case for up and down movement therewith; character forming type on the carrier element, a character selector means slidable along the case for adjusting the type carrier to selectively locate the type thereon in position for being impressed against the printing surface by the downward movement of the case on the carriage member, means to effect a locked relationship between the character selector means and case for the downward actuation of the latter through the mediacy of the selector means, and means operable by the downward movement of the case on the carriage member to turn the indexing wheels for a definite advancement of the carriage member on the said surface.

2. A printing device of the character described comprising a vertical carriage member, interval indexing wheels at its lower end adapted to be engaged against a printing surface, a case applied to the carriage member and having limited up and down movement therealong, belt mountings mounted on the case and movable therewith, one of said mountings being at the lower end of the case; a belt mounted for travel on said mountings and equipped at intervals therealong with character printing type, a character selector member freely slidable along the case and having connection with the belt for the movement thereof in the selective positioning of the type characters at the lower end of the case in position for their impression against the printing surface incident to moving the case to its lower limit of travel on the carriage member and means on the selector member for effecting a holding connection with the case.

3. A printing device of the character described

comprising an upright carriage member equipped at its lower end with interval indexing means for engaging against a printing surface, a case applied about the carriage member and having limited up and down movement therealong, yieldable means normally supporting the case at its upper position on the carriage member, an adjustable type carrier mounted in the case and movable therewith, a sleeve freely slidable on the case for adjusting the carrier to selectively locate the type in position at the lower end of the case for being impressed against the printing surface incident to movement of the case to its lower limit of travel on the carriage member, means operable by such printing movement of the case for functionally actuating the indexing means for the spacing of successively printed characters and means on the sleeve for effecting a temporary interlock between the sleeve and case for the movement of the latter through the mediacy of the sleeve.

4. A device as recited in claim 3 wherein the indexing means comprises a pair of wheels engaging the surface for the guided movement of the carriage, a ratchet for rotating the wheels and a pawl on the case engageable with the ratchet to rotate the wheels a definite interval with each printing action of the case and prior to the impressing of the type against a surface.

5. A printing device of the character described comprising a vertical carriage member, interval indexing wheels at its lower end adapted to be engaged against a printing surface, a case applied about the carriage member for limited up and down movement thereon, yieldable means acting against the case to normally support it at its upper position on the carriage member, a belt guide member mounted in the case at its lower end, another belt guide member in the upper portion of the case, an endless belt mounted for travel about said guide members, type characters applied to the belt at spaced intervals therealong; said case having character designations thereon corresponding to the said type characters, and a type selector member freely movable on the case, means operatively connecting the selector with the belt for moving the latter, whereby the positioning of the selector in registration with any character designation will move the belt to locate the corresponding type in position for its being impressed against the printing surface incident to movement of the case to its lower limit on the carriage member and yieldable means on the selector member adapted to be pressed into holding contact with the case for its downward actuation to effect a printing operation.

6. A device as recited in claim 5 including an inking pad in the case and means operable by said downward actuation of the case along the carriage to effect inking contact of the pad with type on the type belt.

7. A printing device of the character described comprising an upright carriage adapted to be engaged at its lower end against a printing surface, a tubular case enclosing the said member for up and down adjustment therealong and open at its lower end for the said carriage to project therefrom, a belt guide pulley in the case at its lower end, another belt guide pulley in the case near its upper end, an endless belt operable over said pulleys, character printing type mounted on the belt, a spring acting against the carriage and case to normally hold the latter in its lifted position and the type belt clear of the printing sur-

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face, a type selector member movable freely along the case without lifting it from the printing surface and having an operative connection with the belt for the selective positioning of its type in printing position at the lower end of the case, and means on the selector member for effecting a holding connection with the case whereby a downward movement of the case to effect the printing of a selected type may be effected through a hand hold on the selector member.

8. A printing device as recited in claim 7 wherein a pair of indexing and guide wheels is provided on the carriage at its lower end for engaging the printing surface, and pawl and ratchet means is operable automatically with the initial downward travel of the case on the carriage to actuate said indexing wheels to shift the device for character spacing.

9. A device of the character described comprising a carriage adapted for contact at one end with a printing surface, a case enclosing the carriage for limited up and down movement thereon and having an open lower end for the carriage end to extend in contact with the printing surface therethrough, belt mounting pulleys in the case, one being at its lower end; a continuous belt extended about the pulleys in the case, type fixed on the belt at spaced intervals therealong substantially throughout its length, a type selector member slidable along the case, a link pivotally connected at its ends to said selector member and belt for the adjustment of the belt to selectively dispose the type in printing position at the lower end of the case, and means for causing the link end that is attached to the belt to be urged across the dead center whenever shifted to its lowermost limit, whereby movement of the selector member between its limits in one direction along the case will bring the type on one run of the belt to printing position and its movement between said limits in its other direction will bring the type of the other run into printing position.

10. A device of the character described comprising a carriage adapted to be placed in contact at its lower end with a printing surface, a case enclosing the carriage, belt mounting pulleys in the case at its upper and lower ends, a type mounting belt extended about said pulleys, a type selector sleeve slidable on the case, a rigid arm extended from the selector sleeve to a line between said pulleys, a link pivotally connecting the inner end of the arm and belt, for effecting travel of the belt for type selection by the shifting of the sleeve along the case, and means for causing the link end to be urged across the dead center from one side of the lower pulley to the opposite side, when it is shifted by the selector means to its lowermost limit of travel.

11. A device as in claim 10 wherein the means for shifting the link across the dead center line comprises a transverse abutment member on the link having a V-shaped projection directed downwardly therefrom along the center line of the link, and a laterally flexible prong mounted at its lower end on the case and extended upwardly to a position for contact at its upper end with a side surface of the V-shaped projection, when

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the link approaches its lower limit of travel, thereby to be guided into contact with the abutment at one side of the V-shaped projection, to rock the link on its mounting and cause its lower end to be urged across the dead center line of travel across the lower guide pulley.

12. A printing device of the character described comprising a carriage member adapted to be engaged at its lower end against a printing surface, a case applied about the carriage member for limited up and down movement thereon, yieldable means acting against the case to normally support it at its upper position on the carriage member, a belt guide member mounted in the case at its lower end, another belt guide member in the upper portion of the case, an endless belt mounted for travel about said guide members, type characters applied to the belt at spaced intervals therealong; a type selector member slidable on the case, an arm fixed to the selector member and extended inwardly therefrom to the line of the guide member axes, a link pivotally connected at its ends to the end of said arm and to the belt, a transverse abutment member on the link adjacent its point of connection with the arm, having a V-shaped projection extended therefrom downwardly along the link, and a laterally flexible prong mounted at its lower end on the case and extended upwardly to a position for contact at its upper end with a side surface of the V-shaped projection when the link approaches its lower limit of travel, thereby to be guided into contact with the abutment at one side of the V-shaped projection to rock the link in its mounting across the dead center line of travel.

13. In a printing device, a case, a pair of spaced belt carriers mounted on the case, an endless type carrier belt extended about the said carriers for travel thereon, a type selector member slidable in opposite directions along the case parallel with the line of the belt carriers, a link pivotally connected at its ends to the belt and to the selector member for moving the belt by the shifting of the selector member along the case, and means on the case adjacent one of the belt carriers for causing the link to be urged across the dead center point from one side of the carrier to the other when the link reaches that limit of travel.

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