

April 25, 1967

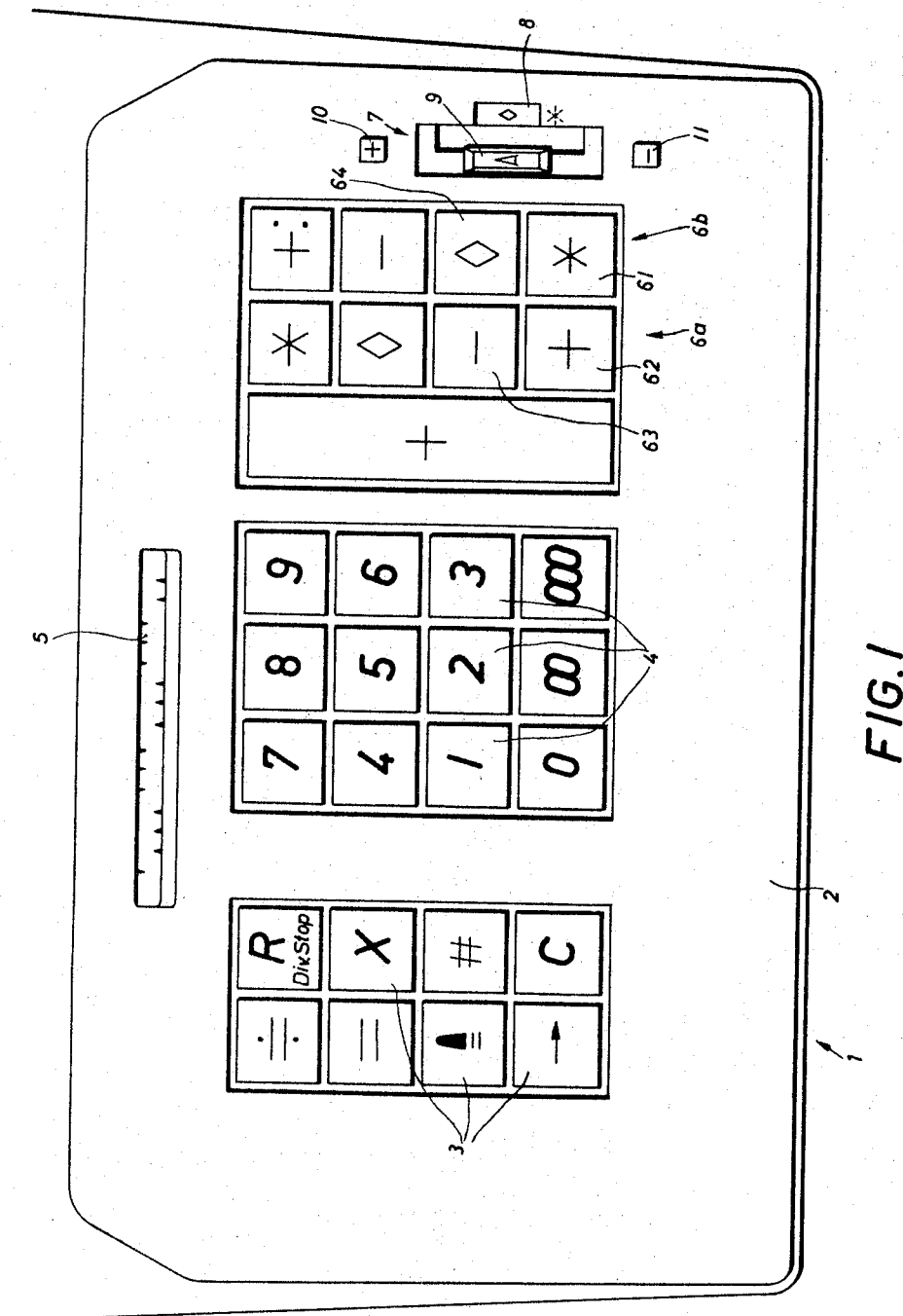
P. THEVIS

3,315,889

CONTROL KEY ARRANGEMENT FOR A CALCULATOR

Filed April 26, 1965

4 Sheets-Sheet 1



INVENTOR
BY: *Paul Theris*
Michael J. Straker
ATTORNEY

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P. THEVIS

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CONTROL KEY ARRANGEMENT FOR A CALCULATOR

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4 Sheets-Sheet 2

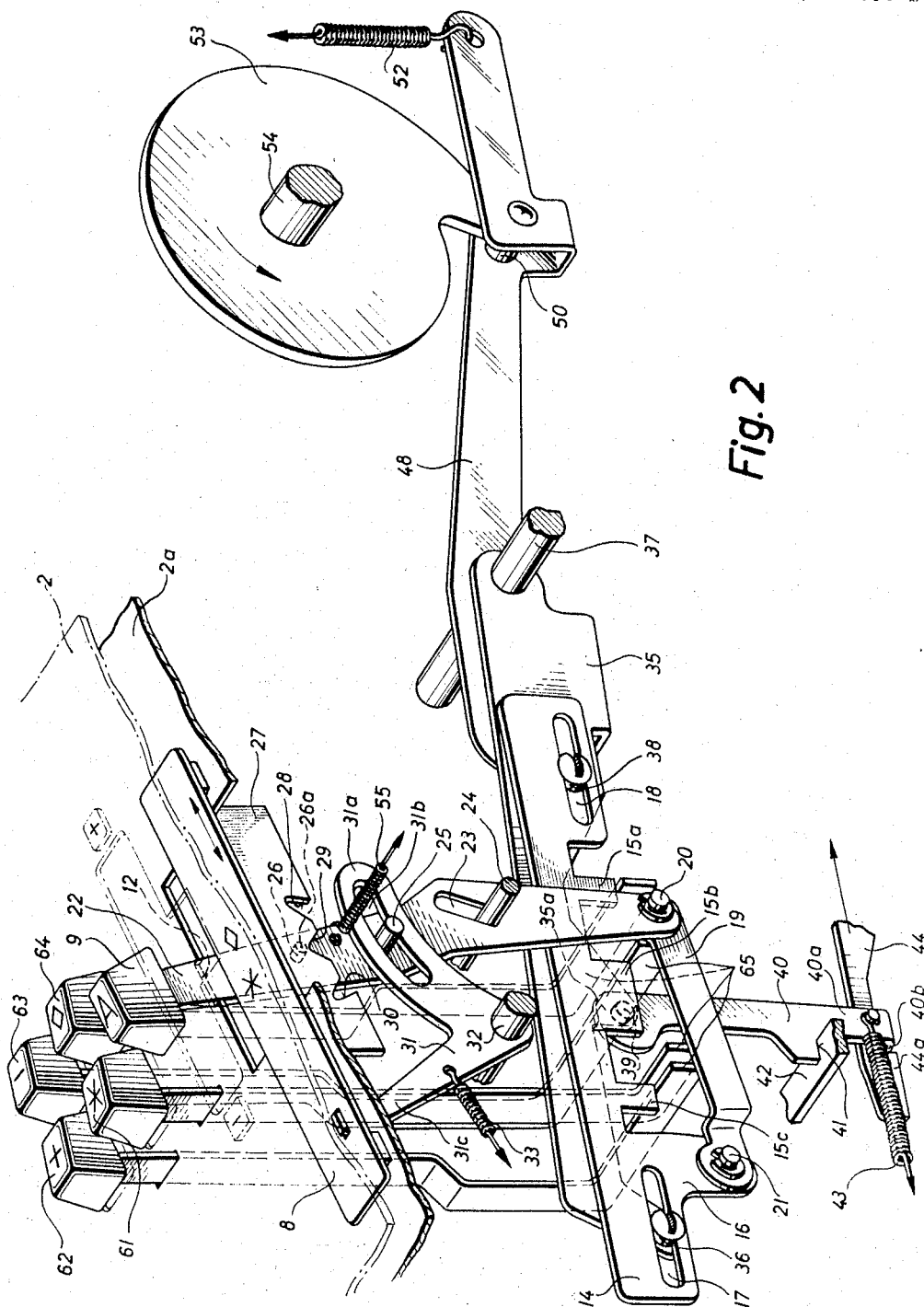


Fig. 2

INVENTOR
BY: *Patent Theorist*
Michael J. V. V. V.
ATTORNEY

April 25, 1967

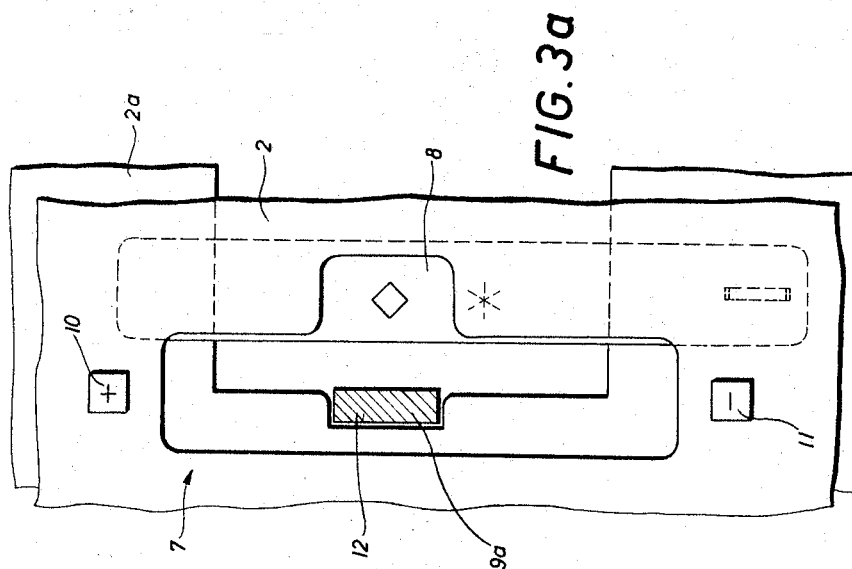
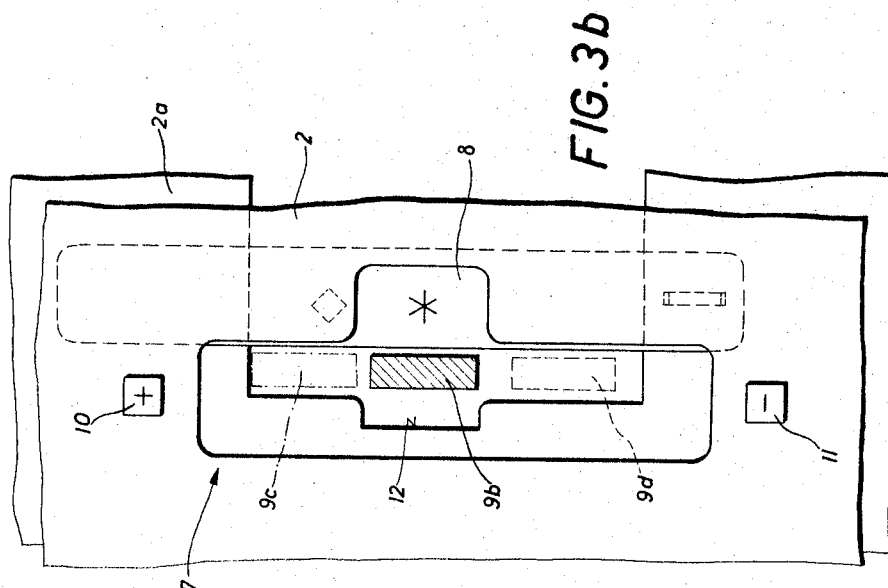
P. THEVIS

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CONTROL KEY ARRANGEMENT FOR A CALCULATOR

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4 Sheets-Sheet 3



INVENTOR
Paul Thevis
BY: Michael J. Striker
ATTORNEY

April 25, 1967

P. THEVIS

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CONTROL KEY ARRANGEMENT FOR A CALCULATOR

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4 Sheets-Sheet 4

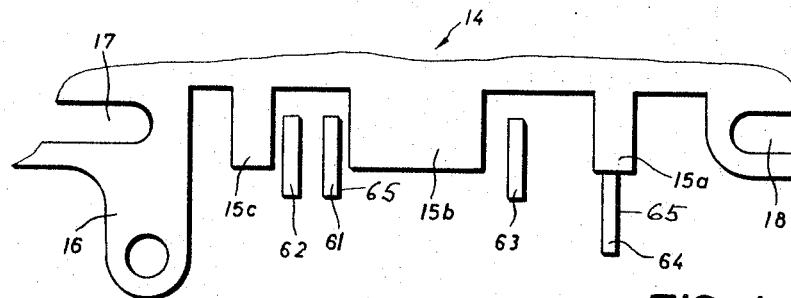


FIG. 4a

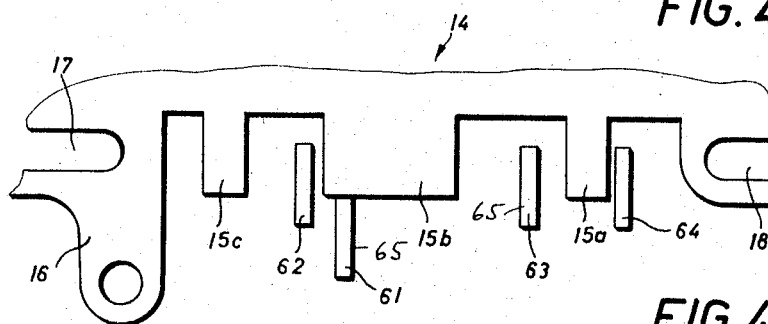


FIG. 4b

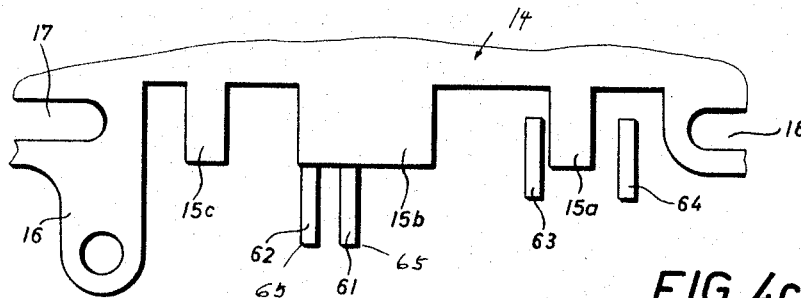


FIG. 4c

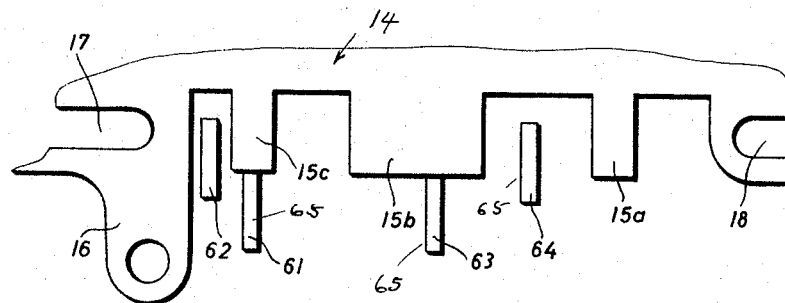


FIG. 4d

INVENTOR
BY: Paul Thevis
Michael J. Striker
ATTORNEY

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3,315,889 CONTROL KEY ARRANGEMENT FOR A CALCULATOR

Paul Thevis, Oberndorf (Neckar), Germany, assignor to
Olympia Werke AG., Wilhelmshaven, Germany

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O 10,391

19 Claims. (Cl. 235-145)

The present invention relates to a control key arrangement for a calculator, and more particularly to a control key for selecting and starting certain operations of a calculator, particularly a calculator capable of performing three or four species operations.

In calculators of this type, an automatic control of total taking operations and subtotal taking operations, and the positive or negative storing of values is desired.

On the other hand, it is necessary to provide a simple keyboard so that it is undesirable to add a great number of special keys to the calculator. Such additional special keys confuse the operator, who may hesitate to operate a machine having an unfamiliar keyboard.

It is one object of the present invention to provide a multifunction control key movable between several positions, for example, four positions, for selecting different calculating operations.

Another object of the invention is to provide a multifunction control key movable between a plurality of positions for starting subtotal taking operations, total taking operations, and positive and negative storing operations.

Another object of the invention is to achieve a maximum of calculating operations by actuation of one control key.

Another object of the invention is to provide a keyboard with a multifunction control key for selecting a plurality of different calculating operations.

With these objects in view, the present invention relates to a multifunction control key which is movable between a plurality of positions for causing the calculator to perform a plurality of different operations. In the preferred embodiment of the invention, the control key is mounted for movement between four positions, respectively associated with the automatic taking of a subtotal, the automatic taking of a total, the automatic positive storing of a total, and the automatic negative storing of a total.

The control key is mounted for a translatable movement between a normal position and a depressed position, and for turning movement between two other positions. Before the control key can be turned, it must first be depressed.

In the preferred embodiment of the invention, the shifting of the control key between the four positions, causes a coupling means to move between four coupling positions for connecting the drive means of the calculator with actuating members, for example, actuating keys, by which certain calculating operations are started.

It is preferred to mount the control key adjacent the actuating keys which are automatically operated by the drive means when the control key is shifted between its four positions. Preferably, an indicating member carrying indicia "total" and "subtotal" is operated by the control key to indicate the calculating operations obtained by setting the control key to different positions.

The normal position of the multifunction control key corresponds to the automatic taking of a subtotal. When the control key is depressed, a total is automatically taken. When the control key is turned to one position, a total is positively stored in an automatic operation, whereas in the other turned position of the control key, a total is negatively stored in an automatic operation.

The indicating member which is controlled by the con-

trol key is constructed in such a manner that in the depressed position of the control key, the indicia "total" is in the indicating position.

In order to obtain the automatic calculating operations, coupling means are provided for coupling the drive means of the calculator with the actuating keys which are associated with several operations, respectively. By operation of the control key, the coupling means is shifted between four different coupling positions for connecting selected actuating keys with the drive means of the machine. More particularly, the coupling means includes a shiftable coupling member having projections which are respectively located opposite coupling projections of the actuating keys in the several coupling positions of the coupling member in which the latter is placed by operation of the control key. For example, the stem of the control key is provided with a slanted slot in which a guide pin is located so that the depressed control key is shifted for shifting the coupling member between two coupling positions. The turning of the control key effects a corresponding shifting of the coupling member between two other coupling positions.

In the preferred embodiment of the invention, the drive means include an operating lever which is urged by a spring to move the coupling member to a position engaging the respective coupling portion of the respective actuating key for shifting the latter. The spring-loaded operating lever is normally locked, but is released to move to the engaging position during an operational cycle of the machine, for example, after completion of a multiplication operation. The operating lever is reset to its initial position by a rotary cam.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

FIG. 1 is a plan view illustrating the keyboard of a calculator according to the invention;

FIG. 2 is a fragmentary perspective view illustrating one embodiment of the invention;

FIG. 3a is a fragmentary plan view on an enlarged scale, partially in section, and illustrating the normal position of a control key according to the invention;

FIG. 3b is a plan view corresponding to FIG. 3a but illustrating other operational positions of the control key; and

FIGS. 4a to 4d illustrate different coupling positions of the coupling means connecting the drive means of the machine with the actuating keys.

Referring now to the drawings, and more particularly to FIG. 1, the keyboard 1 of a ten key calculator has a cover plate 2 provided with cutouts in which the standard keys of the calculator are disposed, namely function keys 3 including a multiplication key, number keys 4, a row of special actuating function keys 6a associated with a storage register, and a row of actuating keys 6b associated with the result register and with corresponding calculating operations.

Adjacent the keys 6b which cause the entry of results into a result register, a cutout 7 for a control key 9 is provided in cover plate 2. As will be described hereinafter in greater detail, the control key 9 has a normal position and can be depressed to another position, and turned with its stem 22 between the ends of cutout 7 to two other positions, 9c and 9d, so that control key 9 has altogether four positions. In the normal position illustrated in FIG. 1, the control key 9 is prevented from

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turning movement since its stem 22 is located in a cutout 12 in a plate 2a, as shown in FIG. 3a.

Another cutout 8a in the cover plate 2 is provided for viewing an indicia on a shiftable indicating member 8 which is located under the cover plate, and is shifted between indicating positions when control key 9 is depressed. Since the normal position of control key 9 corresponds to the automatic taking of a subtotal, the corresponding indicia is visible in FIGS. 1 and 3a, the normal position of the control key being designated by a reference numeral 9a in FIG. 3a. When the control key is depressed, the indicia indicating "total" is visible in cutout 8a. Evidently, other indicia could be provided on indicating member 8.

On the opposite ends of the slot or cutout 7, indicia 10 and 11 indicating positive and negative values are secured to cover plate 2, and the two turned positions 9c and 9d of the control key 9, shown in FIG. 3b, are identified by indicia 10 and 11.

Referring now to FIG. 2, four actuating function keys 61, 62, 63, and 64, also shown in FIG. 1, have stems which have transverse coupling portions 65, also shown in FIGS. 4a to 4c and identified in FIGS. 4a to 4c also by the reference numerals of the respective actuating keys. Control key 9 has a stem 22 carrying a pivot 20 with a connecting link 19 articulated by another pivot pin 21 to a lug 16 on a coupling member 14 in the form of a plate having a pair of slots 17 and 18, and projections 15a, 15b, 15c. As best seen in FIG. 4a to FIG. 4c, coupling member 14 can be shifted on a pair of guide pins 36, 38 located in slots 17 and 18 between four coupling positions in which different portions 15a, 15b, 15c cooperate with coupling portions 65 of actuating keys 61 to 64.

Pins 36 and 38 are respectively secured to an operating lever 35 mounted on a stationary shaft 37 for turning movement, and having an arm 48 connected to a spring 52 which biases operating lever 35, 48 to turn in counterclockwise direction to the position illustrated in FIGS. 4a to 4c for moving engaged coupling portions 65 downward together with the respective keys 61 to 64. A locking member 40 is connected by a pivot pin 39 to operating lever 35 and has a projection with a shoulder 41 resting on a locking member 42. In the position illustrated in FIG. 2, operating lever 35 cannot be turned by spring 52 in counterclockwise direction, and holds coupling member 14 in a higher normal position in which projections 15a, 15b, 15c are located above the level of the upper edges of coupling portions 65 of actuating keys 61 to 64 while the latter are in the normal higher inoperative position. Locking member 40 has a portion 40b cooperating with a hook 44a of a releasing member 44. When releasing member 44 is moved to the right as viewed in FIG. 2 and in the direction of the arrow against the action of a spring 43, locking member 40 turns about pin 39 to a position in which shoulder 41 releases locking member 42, so that the operating lever 35, 48 is released and can be turned by spring 52 in counterclockwise direction for depressing selected actuating keys 61 to 64.

Control key 9 has a stem 22 provided with a slanted slot 23 receiving a stationary guide pin 24 which is secured to the frame, not shown, of the machine. When control key 9 is depressed from its normal higher position in a translatable movement to a lower position, stem 22 is displaced in a transverse translatable movement due to the slanted position of slot 23, and shifts coupling member 14 in longitudinal direction thereof from a normal position corresponding to the position of FIG. 4a, to the position shown in FIG. 4b. However, FIGS. 4a and 4b show coupling member 14 already lowered by operating lever 35, 48, as will be explained hereinafter in greater detail. During the translatable movement of control key 9 and the consequent displacement of coupling member 14, the lower edges of projections 15a, 15b, 15c are located above the level of the coupling portion 65 so that

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shifting of coupling member 14 is possible. When control key 9 is transversely displaced from the position 9a of FIG. 3a to the position 9b of FIG. 3b, it is no longer confined in cutout 12, and can be turned between the positions 9c and 9d. Such turning movement causes corresponding displacement of pivot pin 20 and link 19 and shifting of coupling member 14 to two other coupling positions corresponding to the positions of coupling member 14 shown in FIGS. 4c and 4d, but located higher than illustrated in FIGS. 4d and 4b.

Arm 48 of operating lever 35 has a U-shaped portion with a cam follower pin 50 cooperating with a rotary cam 53 driven by drive shaft 54 during the operational cycle of the machine. When locking means 40, 41, 42 are released, and coupling member 14 is lowered by lever 35, 48 and spring 52, the lug of rotary cam 53 engages pin 50, lever 48, 35 is turned in clockwise direction until locking member 40 again engages locking member 42 under the action of spring 43 and locks lever 35 in its higher position in which coupling member 14 is also in the higher normal position in which the lower edges of projections 15a, 15b, 15c are located above coupling portions 65. The guide pins 36 and 38 are thus locked in a position in which they guide coupling member 14 for translatable movement between four coupling positions under the control of control key 9.

Stem 22 of control key 9 carries a fixed pin 25 located in an elongated slot 31b of an angular shifting lever 31 which is mounted on a stationary shaft 32 for turning movement. One arm 31c of shifting lever 31 engages a cutout in indicating member 8 so that the same is shifted when shifting lever 31 is turned. A spring 33 is secured to shifting lever 31 and urges the same to turn in counterclockwise direction as viewed in FIG. 2 so that indicating member 8 assumes the normal position in which the indicia related to a subtotal is visible in cutout 8a, as shown in FIG. 3a and FIG. 1. When control key 9 is depressed, shifting lever 31 is turned in clockwise direction and shifts indicating member 8 to another indicating position in which another indicia representing a total is located in cutout 8a, as shown in FIG. 3b. Turning of control key 9 does not affect shifting lever 31 due to the provision of slot 31b, and the corresponding positions 9c and 9d of control key 9, see FIG. 3b, are indicated by the fixed indicia 10 and 11.

Below cover plate 2, another fixed plate 2a is provided on which indicating member 8 is guided for translatable movement. Below plate 2a, an arresting plate 27 is mounted which has three notches 28, 29, 30 cooperating with an arresting pin 26 secured to stem 22 of control lever 9.

In the normal higher and central position of control key 9, the end face 26a of arresting pin 26 abuts a lateral face of arresting plate 27 under the action of a spring 55 secured to stem 22 and urging the same from the position 9a shown in FIG. 3a to the position 9b shown in FIG. 3b.

When control key 9 is depressed, end face 26a of arresting pin 26 slides off the lateral face of arresting plate 27 and snaps into recess 29, arresting control key 9 in the lower depressed position. In this lower position, stem 22 is transversely displaced and no longer located in cutout 12 so that control key 9 can be turned about pin 24 between two positions in which arresting pin 26 is located in notches 28 and 30, respectively for arresting control key 9. Cover plate 2 is illustrated in thin lines in FIG. 2 so that it is apparent that the lower plate 2a is provided with cutout 12 while the corresponding edge of the slot 7 in cover plate 2 is straight.

In the illustrated embodiment, actuating key 61 is the total key associated with the result register, actuating key 62 is the plus key for a storage register, actuating key 63 is the minus key for the storage register, and actuating key 64 is a subtotal key for the result register.

In the initial normal position 9a of control key 9,

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stem 22 is located in cutout 12 of plate 2a, and control key 9 cannot be turned, but only depressed in a translatable movement to a lower position. Spring 33 acting through shifting lever 31 and pin 25 biases control key 9 to assume its higher normal position.

In the normal position of control key 9, connecting link 19 is also in a higher position. Operating lever means 35, 48 is also held in a higher position, and the lower edges of projecting portions 15a, 15b, 15c of coupling member 14 are located above the level of the upper edges of coupling portion 65 of keys 61 to 64.

When a machine operation is started, releasing member 44 is shifted with hook 44a, and locking member 40 is turned to a position releasing locking member 42 so that spring 52 turns operating lever 48, 35 in counter-clockwise direction to the position illustrated in FIG. 4a. Since in the normal position of control key 9, coupling member 14 is held in a coupling position in which projection 15a is located above coupling portion 65 of key 64, turning of operating lever 35, 48 causes through coupling portion 65 downward movement of key 64 as shown in FIG. 4a, whereas the coupling portion 65 of the other keys 61, 62, 63 are not influenced since they are located opposite corresponding cutouts of coupling member 14. The normal position of control key 9, and actuating key 64 which is automatically operated in the normal position of control key 9, are associated with the taking of a subtotal from the result register and entering of the same again into the result register. Therefore, no manual operation of control key 9 or of actuating key 64 is necessary for the performance of this operation.

The shifting of releasing member 44 is carried out after the completion of a multiplication so that the subtotal taking operation is carried out with the result of the multiplication. At the end of the operational cycle, rotary cam 53 engages with its lug pin 50 of operating lever 48, 35 and returns the same in clockwise direction to its initial position, raising at the same time coupling member 14 and locking member 40 so that the same snaps into its locking position engaging locking member 42 with shoulder 41 under the action of spring 43.

When control key 9 is depressed from its normal higher position in a translatable movement to a lower first position, the slot and guide pin connection 23, 24 causes a translatable movement of stem 22 in the direction of slots 17, 18 so that coupling member 14 is shifted to a position in which projection 15b is located above coupling portion 65 of key 61, while at the same time shifting lever 31 shifts indicating member 8 to a position in which the "total" indicia appears in cutout 8a. Arresting pin 26 slides along the lateral face of arresting plate 27 and snaps into notch 29 so that control key 9 is arrested in the lower position. When releasing member 44 is shifted after a completed multiplication, locking member 40 is released, and spring 52 turns operating lever 35, 48 to move coupling member 14 downward to the engaging position shown in FIG. 4b in which projection 15b engaging coupling portion 65 depresses total key 61 which effects in a known manner the taking of a total from the result register. Rotary cam 53 thereupon causes return of all displaced elements to the normal initial position, with the exception of control key 9 which has to be manually moved from the position 9b shown in FIG. 3b to the position 9a shown in FIG. 3a so that arresting pin 26 releases notch 29, and spring 33 with shifting lever 31 raise control key 9 to its normal position. The corresponding turning of shifting lever 31 and the displacement of indicating member 8 causes appearance of the normal subtotal sign in the cut out 8a.

If a total is to be taken from the result register and entered positively in a storage register, control key 9 is first depressed and then turned to the position 9c shown in FIG. 3b. Control key 9 moves toward indicia 10 so that the positive operation is indicated by the plus indicia 10. At the same time, arresting pin 26 snaps into notch 28 and arrests control key 9.

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The lower end of stem 22 displaces through link 19 coupling member 14 to a position in which the wider coupling projection 15b is located above the coupling portions 65 of keys 61 and 62 of which key 61 is associated with the total taking, and key 62 is associated with the entry of a positive value. At the end of a multiplication releasing means 44 will release locking member 40 so that operating lever 35, 48 moves coupling member 14 downward to the position shown in FIG. 4c causing downward movement of coupling portion 65 of keys 61 and 62 corresponding to a depression of keys 61 and 62 so that the corresponding operations are started in a well known manner. Since key 62 is associated with the storage register, the total is taken from the result register and positively added in the storage register.

In order to automatically obtain a total, and to store the same as a negative value, control key 9 is depressed, shifted to position 9b, and then turned to position 9d. The negative indicia 11 indicates this position of control key 9. Arresting pin 26 snaps into notch 30 of arresting plate 27 and locks control key 9. Stem 22 turns and coupling member 14 is shifted by link 19 to the right until projection 15b is located opposite coupling portion 65 of key 63, and projection 15c is located opposite coupling portion 65 of key 61. Key 63 is associated with the negative storing operation, and key 61 is associated with the total taking. After a completed multiplication, releasing means 44 releases locking member 40 and spring 52 actuates operating lever 35, 48 to move coupling member 14 down so that keys 61 and 63 are moved to a depressed position causing the corresponding storing and total taking operations so that during the operational cycle of the machine, the total is taken from the result register and entered as a negative value into the storage register.

After every operation of the control key 9 to positions 9c, 9d, the same is manually shifted first to the position 9b shown in FIG. 3b, and then laterally shifted to the position 9a so that pin 26 releases the notch 29 of arresting member 27 and control key 9 is raised to its normal position by biasing means 33, 31, 31b.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of calculators differing from the types described above.

While the invention has been illustrated and described as embodied in a calculator having a multifunction control key shiftable between four positions for causing the automatic performance of four different operations by the calculator, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a calculator, in combination, four actuating members for starting different operations of the calculator; drive means; coupling means movable between four coupling positions for respectively connecting said actuating members with said drive means so that different operations are initiated in said four coupling positions; and a control key having four positions and connected to said coupling means for placing the same in a different coupling position in each of said positions of said control key so that by selective actuation of said control key said drive means are connected to selected actuating members for initiating different operations of the calculator.

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2. In a calculator, in combination, four actuating members for starting different operations of the calculator; operating means biased to move to an operative position; locking means for locking said operating means in an in-operative position; releasing means for releasing said locking means during an operational cycle of the calculator; coupling means movable between four coupling positions for respectively connecting said actuating members with said operating means so that different operations are initiated in said four coupling positions; and a control key having four positions and connected to said coupling means for placing the same in a different coupling position in each of said positions of said control key so that by selective actuation of said control key said operating means are connected to selected actuating members for initiating different operations of the calculator.

3. A calculator as set forth in claim 2, wherein said actuating members are actuating keys having stems with coupling portions cooperating with said coupling member so that in each of said four coupling positions of said coupling member, said coupling portion of a different actuating key is engaged and displaced by said coupling member upon movement of said operating means to said operative position whereby the respective actuating key is operated for starting an operation of the calculator.

4. A calculator as set forth in claim 3, wherein said coupling member has a plurality of projections respectively located opposite said coupling portions in said coupling positions; and wherein said operating means includes an operating lever connected to said coupling member for moving the same to an engaging position in which one of said projections thereof engages the respective coupling portions of at least one of said actuating keys for operating the latter.

5. A calculator as set forth in claim 4 and including spring means for urging said operating lever to turn in one direction to move said coupling member to said engaging position; said locking means locking said operating lever for preventing movement of said coupling member to said engaging position; and resetting means for turning said operating lever to its initial position opposite to said one direction at the end of the operational cycle of the calculator.

6. A calculator as set forth in claim 5, wherein said resetting means include a rotary cam having a cam lug for engaging said lever and for turning the same in said opposite direction during each revolution of said rotary cam.

7. In a calculator, in combination, four actuating members for starting four different operations of the calculator; drive means; coupling means movable between four coupling positions for respectively connecting said actuating members with said drive means so that different operations are initiated in said coupling positions; a control key; and means mounting said control key for translatable movement between two first positions, and for turning movement between two second positions, said control key being operatively connected to said coupling means for placing the same in a different coupling position in each of said positions of said control key so that by selective actuation of said control key said drive means are connected to selected actuating members for initiating different operations of the calculator.

8. A calculator as set forth in claim 7 and including arresting means for arresting said control key in said positions thereof, and including an arresting plate having three notches, said control key having an arresting pin located in said three notches, respectively, in said second positions, and in one of said first positions of said control key, and laterally abutting said plate in the other first position of said control key; and spring means for urging said control key to said other first position, and to positions in which said pin is located in said notches, respectively, when said control key is manually moved to said other first position, or to said second positions.

9. A calculator as set forth in claim 7 wherein said

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control key has a stem formed with a slot slanted to the direction of said translatable movement; a stationary guide pin located in said slot for displacing said stem during said translatable movement; and wherein said coupling means include a coupling member shiftable between said four coupling positions and operatively connected with said stem to be shifted between two of said coupling positions when said control key is moved in said translatable movement between said first two positions.

10. A calculator as set forth in claim 9, and including connecting means connecting said stem with said coupling member for shifting the same to the other two coupling positions when said control key is turned between said two second positions.

11. In a calculator, in combination, four actuating keys for starting four different operations of the calculator, and including a total key and a subtotal key for taking result values from a result register, and two keys for entering positive and negative values into a storage register; drive means; coupling means movable between four coupling positions for respectively connecting said actuating members with said drive means so that different operations are initiated in said coupling positions; a control key; and means mounting said control key for translatable movement between two first positions, and for turning movement between two second positions, said control key being operatively connected to said coupling means for placing the same in a different coupling position in each of said positions of said control key so that by selective actuation of said control key said drive means are connected to selected actuating members for initiating different operations of the calculator, one of said first positions being a normal position of said control key and effecting the automatic taking of a subtotal, the other first position being a depressed position of said control key and effecting the automatic taking of a total, one of said second positions being a depressed and rearwardly turned position of said control key and effecting the automatic positive storage of a total, and the other of said second positions being a depressed and forwardly turned position of said control key and effecting the automatic negative storage of a total.

12. A calculator as set forth in claim 11 and including an indicating member carrying indicia; a shifting lever connected with said indicating member and having a slot, and a pin secured to said control key and located in said last mentioned slot for turning said shifting lever and for moving said indicating member when said control key is moved between said first positions.

13. In a calculator, in combination, four actuating members for starting four different operations of the calculator; drive means; coupling means movable between four coupling positions for respectively connecting said actuating members with said drive means so that different operations are initiated in said coupling positions; a control key; means mounting said control key for translatable movement between two first positions, and for turning movement between two second positions, said control key being operatively connected to said coupling means for placing the same in a different coupling position in each of said positions of said control key so that by selective actuation of said control key said drive means are connected to selected actuating members for initiating different operations of the calculator, one of said first positions being a normal position of said control key and effecting the automatic taking of a subtotal, the other first position being a depressed position of said control key and effecting the automatic taking of a total, one of said second positions being a depressed and rearwardly turned position of said control key and effecting the automatic positive storage of a total, and the other of said second positions being depressed and forwardly turned position of said control key and effecting the automatic negative storage of a total.

14. In a calculator, in combination, a manually operable control member having four positions; and means

controlled by said control member in said four positions, respectively, to set the calculator to perform four different operations, the first operation of said operations effecting the automatic taking of a subtotal, the second operation effecting the automatic taking of a total, the third operation effecting the automatic positive storing of a total, and a fourth operation effecting the automatic negative storing of a total.

15. In a calculator, in combination, a manually operable control member having four positions; means controlled by said control member in said four positions, respectively, to set the calculator to perform four different operations; and means mounting said control member for translatable movement between two first positions, and for turning movement between two second positions, one of said first positions being a normal position of rest of said control member and effecting the automatic taking of a subtotal, the other first position being a depressed position of said control member, and effecting the automatic taking of a total, one of said second positions being a depressed and rearwardly turned position of said control member and effecting the automatic positive storage of a total, and the other of said second positions being a depressed and forwardly turned position of said control member and effecting the automatic negative storage of a total.

16. A calculator according to claim 15 and including a casing having a slot through which said control member projects out of said casing, said control member being located at the ends of said slot in said second positions; plus and minus indicia fixedly secured to said casing at the end of said slot; an indicia carrying member movably mounted on said casing adjacent said slot; and means for connecting said control member with said indicia carrying member for movement therewith in said first positions of said control member so that said indicia carrying member is shifted between two indicating positions when said control member is moved between said first position.

17. In a calculator, in combination, a plurality of function keys, each function key being manually movable between an inoperative position and an operative position for effecting different operations of the calculator; operating means; a manually operable control member; means mounting said control member for movement between a plurality of control positions; and means operated by said control member in each of said control positions to connect said operating means with at least one group of said function keys so that the function keys of said group are simultaneously and automatically moved by said operating means to said operative position thereof whereby no

manual operation of said function keys of said group is required when said control member is preset to a selected control position.

18. In a calculator, in combination, four function keys, each function key being manually movable between an inoperative position, and an operative position for effecting different operations of the calculator, and including a total key and a subtotal key for taking result values from a result register, and plus and minus keys for entering positive and negative values into a storage register; drive means; a manually operable control member; means mounting said control member for movement between a plurality of control positions; and means operated by said control member in each of said control position to connect said drive means in two of said control positions with said total key and said subtotal key, respectively, and in two other control positions simultaneously with said total key and said plus key, and simultaneously with said total key and said minus key, respectively, so that the respective connected keys are automatically moved by said drive means to said operative position thereof whereby no manual operation of said function keys is required after a multiplication when said control member is preset to a selected control position.

19. A calculator according to claim 18 wherein said mounting means mount said control member for translatable movement between a first control position which is the normal position of said control member, and a second depressed control position, and for turning movement between a third control position and a fourth control position.

References Cited by the Examiner

UNITED STATES PATENTS

2,528,647	11/1950	Garbell	235—130
2,533,075	12/1950	Werner	235—130 X
2,545,649	3/1951	Capellaro	235—145 X
2,658,669	11/1953	Duke	235—62 X
2,665,844	1/1954	Westinger et al.	235—60.2
2,705,106	3/1955	Westinger et al.	235—60.2
2,792,990	3/1957	Sepanak	235—62 X
2,861,746	11/1958	Anderson	235—145 X
2,884,190	4/1959	Goffe et al.	235—63
2,984,412	5/1961	Sundstrand	235—60
3,061,187	10/1962	Bacher	235—60.5

RICHARD B. WILKINSON, *Primary Examiner*.

T. J. ANDERSON, S. A. WAL, *Assistant Examiners*.