

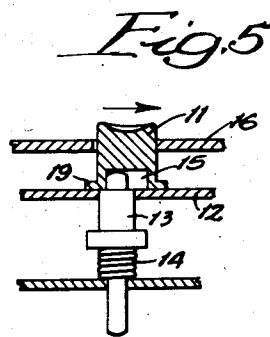
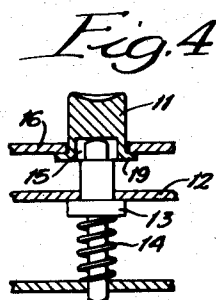
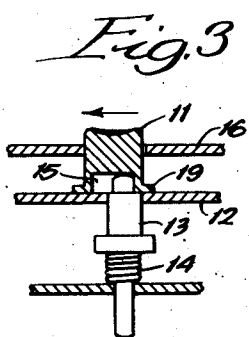
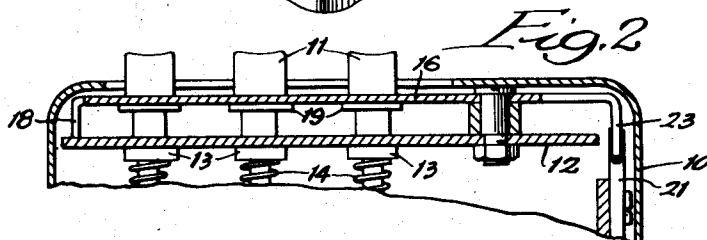
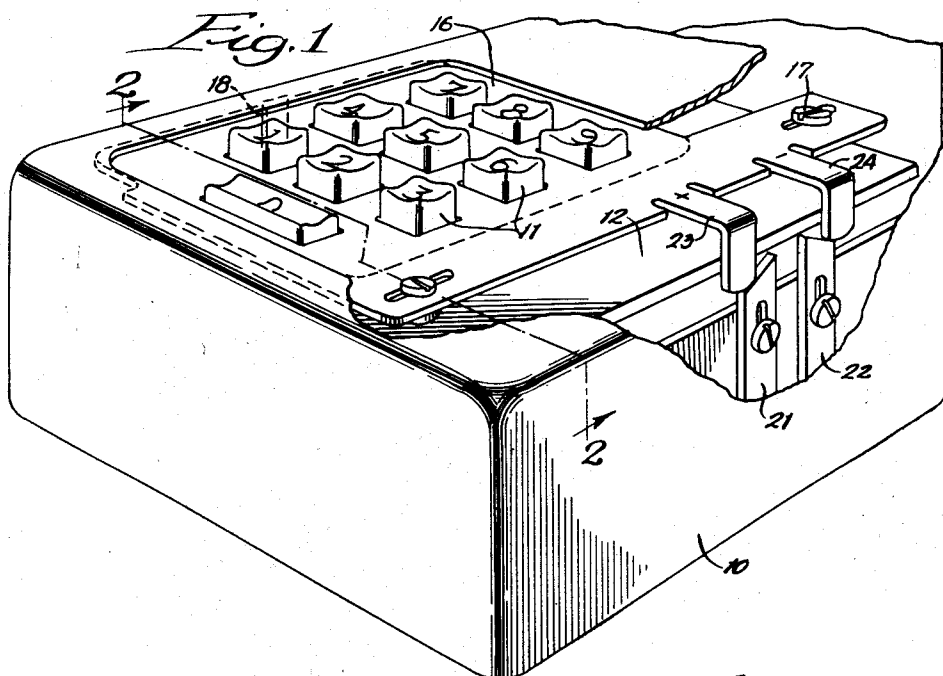
Oct. 27, 1953

H. C. FOX

2,656,980

KEY OPERATING MEANS FOR COMPUTING MACHINES

Filed April 18, 1952



INVENTOR:
Harold C. Fox,
BY
E. A. Brath,
ATTORNEY.

UNITED STATES PATENT OFFICE

2,656,980

KEY OPERATING MEANS FOR COMPUTING MACHINES

Harold C. Fox, Woodstock, Ill.

Application April 18, 1952, Serial No. 283,037

11 Claims. (Cl. 235-145)

1

2

This invention relates to computing machines and more particularly to controlling and operating means for computing machines such as adding machines, calculating machines, check protectors, cash registers, tabulating machines and the like.

In key operated computing machines, it is conventional to provide a plurality of number keys which are selectively depressed to set up a number in the machine and a separate operating lever or key to control the operation of the machine. In machines capable of several different types of operations, a selector key or lever is provided to select the desired operation or different operating keys may be provided to control the different types of operation of the machine. Therefore, after setting up the desired number, the operator must perform at least one additional operation on a separate operating key or lever to effect such operation of the machine. This additional movement of the operator's hand is tiring and time consuming. Furthermore, it is necessary to provide additional operating and selecting keys or levers which increase the size and cost of the machine.

It is one of the objects of the present invention to provide a computing machine in which operation of the machine is controlled through the same number finger buttons which are utilized to set up the machine.

Another object is to provide a computing machine, which is set up in the usual manner by depressing the number finger buttons and is operated by movement of the number finger buttons in a direction at an angle to their setting up movement.

According to one feature, the number finger buttons extend slidably through an operating plate and are movable laterally to shift the operating plate to control operation of the machine. The operating plate is preferably mounted for movement in a plurality of different directions to select different operations of the machine.

The above and other operations and features of the invention will be more readily apparent from the following description when read in connection with the accompanying drawing in which Figure 1 is a partial perspective view with parts broken away of a computing machine embodying the invention; Figure 2 is a section on the line 2-2 of Figure 1, and Figures 3, 4 and 5 are sectional views through a single key showing different positions thereof.

The invention is illustrated in connection with a computing machine capable of performing addition and subtraction. It will be apparent

however, that the principles of the invention can be applied to many different types of machines, capable of performing many different types of operations.

The machine illustrated comprises a casing or housing 10 which is open at its top for projection of a plurality of number keys 11 there-through. The machine illustrated is a conventional 10-key type of machine having ten operating keys numbered from 1 through zero although multiple bank machines can be used equally well or machines having other different key arrangements for special types of operations. The machine carries at its rear end, indicating or printing mechanism not shown, on which the computations may be indicated or printed on tapes as desired.

As best seen in Figure 2, the machine carries near its open top a plate 12 which is rigidly mounted in the frame of the machine and through which a plurality of key stems 13 corresponding in number and spacing to the key finger buttons 11 extend. The key stems are urged upward by springs 14 and are adapted to be moved downward into the machine to set up the machine. Each key stem terminates at its upper end in a relatively small tip which seats slidably into an enlarged recess or cavity 15 in the lower end of a key finger button so that when the key finger buttons are depressed, the key stems will be moved downward with them and the key finger buttons can have a limited lateral movement relative to the key stems.

According to the present invention, this lateral movement of the key finger buttons is utilized to control operation of the machine. For this purpose, an operating plate 16 is slidably mounted on the plate 12. As shown, the plate 16 is supported above the plate 12 by guide pins 17 which extend through slots in the plate 13 to hold the plate 16 properly spaced above the plate 12 and to guide it for either forward or reverse sliding movement. Two guide pins 17 adjacent to one side of the plate 16 are provided and at its opposite side the plate 16 has a downwardly extending lug 18 which rests slidably on the plate 12 to hold the plate 16 spaced properly from the plate 12. The key finger buttons 11 extend slidably through openings in the plate 16 and are preferably formed with flanges 19 as shown in Figures 3 to 5 to limit outward movement thereof relative to the plate 16.

The machine is set up for different operations and is caused to operate by means of a conventional operating mechanism not shown in detail herein but which includes slidable operating

fingers 21 and 22. For example, the finger 21 when depressed, may set up the machine for an adding operation and may control a power device such as an electric motor to effect operation of the machine to produce addition. The finger 22 when depressed may set up the machine for a subtraction operation and may control the power device to cause the machine to effect subtraction. Where tabulating operations are desired, depression of one of the fingers may operate the machine to tabulate and depression of the other finger may operate the machine to add. In machines such as check protectors or cash registers where only a single operation is performed, only one operating finger would be employed and depression thereof would control the machine to effect either a check printing operation or opening of the cash drawer of a cash register and addition of the number set up. It will therefore be apparent that the present invention can be applied to substantially any type of key-operated machine to control the desired operations thereof.

The operating fingers 21 and 22 terminate at their upper ends in sloping cam surfaces and the operating plate 16 is formed with projecting lugs 23 and 24 to engage the upper cam surfaces on the operating fingers when the plate is shifted in one direction or the other. If more than two operations are desired, the plate 16 may be mounted for sideways as well as forward and backward movement and may carry additional projecting lugs to cooperate with additional operating fingers.

In operation of the machine, numbers may be set up in the usual manner by depressing selected ones of the key finger buttons. When a number has been set up, the operator may simply shift either forward or backward the last key finger button utilized in setting up the number to select the desired operation such as addition or subtraction. If the key finger button is pushed towards the rear of the machine, for example the lug 23 will cam the finger 21 downward to add the number set up to numbers previously set up in the machine. If the key finger button is pulled forward, it will slide the plate 16 forward so that the lug 24 will engage the fingers 22 and press it downward to effect a subtraction operation. If it is desired to cause operation of the machine without depressing a key finger button, this can be accomplished very simply by moving any one of the key finger buttons laterally without depressing it to shift the operating plate 16 and effect the desired operation.

Therefore, while one specific embodiment of the invention has been shown and described in detail, it will be understood that this is for the purposes of illustration only and is not to be taken as a definition of the scope of the invention reference being had for this purpose to the appended claims.

What is claimed is:

1. In a computing machine key operating means comprising a plurality of number keys having finger buttons lying in side by side relationship, means mounting the finger buttons for setting up movement and for operating movement in a plane at substantially right angles to their setting up movement, and operating means for the machine including parts lying adjacent to the finger buttons to be engaged and moved thereby upon operating movement of any one of the finger buttons.

2. In a computing machine key operating

means comprising a plurality of number keys having finger buttons lying in side by side relationship, means mounting the finger buttons for setting up movement and for lateral operating movement at an angle to the setting up movement, and operating means for the machine including parts lying beside the finger buttons to be engaged and moved thereby upon lateral operating movement of any one of the finger buttons.

3. In a computing machine key operating means comprising a plurality of number keys having finger buttons lying in side by side relationship, means mounting the finger buttons for setting up movement and for lateral operating movement at an angle to the setting up movement, an operating plate having openings therein through which the finger buttons extend, the finger buttons engaging and shifting the plate upon lateral operating movement thereof, and operating means for the machine including a part lying adjacent to the plate to be engaged and moved thereby when the plate is shifted.

4. In a computing machine key operating means comprising a plurality of number key finger buttons in generally parallel side by side relationship, means mounting the key finger buttons for longitudinal setting up movement and for lateral operating movement, and operating means for the machine including parts lying beside the key finger buttons to be engaged and moved thereby upon lateral operating movement of the key finger buttons.

5. In a computing machine key operating means comprising a plurality of number key finger buttons in generally parallel side by side relationship, means mounting the key finger buttons for longitudinal setting up movement and for lateral operating movement, an operating plate having openings therein through which the key finger buttons slidably extend and which is engaged and shifted by the key finger buttons when they are moved laterally, and operating means for the machine controlled by shifting of the plate.

6. In a computing machine key operating means comprising a plurality of number key finger buttons in generally parallel side by side relationship, means mounting the key finger buttons for longitudinal setting up movement and for lateral operating movement, an operating plate having openings therein through which the key finger buttons slidably extend and which is engaged and shifted by the key finger buttons when they are moved laterally, operating means for the machine including a movable operating finger having an angular cam end surface, and a projecting part on the plate engageable with the cam end surface when the plate is shifted to move the operating finger.

7. In a computing machine key operating means comprising a plurality of number key finger buttons in generally parallel side by side relationship, means mounting the key finger buttons for longitudinal setting up movement and for lateral operating movement, an operating plate having openings therein through which the key finger buttons slidably extend and which is engaged and shifted by the key finger buttons when they are moved laterally, operating means for the machine including a pair of movable operating parts adapted when moved to cause different operations of the machine, and means on the plate to engage and move one of the operating parts when the plate is shifted in one di-

rection and the other operating part when the plate is shifted in another direction.

8. In a computing machine key operating means comprising a frame, a plurality of key stems mounted in the frame in generally parallel side by side relationship and adapted to be moved longitudinally for setting up the machine, a key finger button for each of the key stems engaging the upper end thereof and adapted to be depressed to move the associated key stem longitudinally, the finger buttons being movable laterally relative to the key stems, and operating means for the machine including parts lying beside the finger buttons to be engaged and moved thereby upon lateral movement of the finger buttons.

9. In a computing machine key operating means comprising a frame, a plurality of key stems mounted in the frame in generally parallel side by side relationship and adapted to be moved longitudinally for setting up the machine, a key finger button for each of the key stems engaging the upper end thereof and adapted to be depressed to move the associated key stem longitudinally, the finger buttons being movable laterally relative to the key stems, a plate shiftable laterally on the frame and having openings therein through which the finger buttons slidably extend so that the plate will be shifted laterally by lateral movement of the finger buttons, and operating means for the machine controlled by lateral shifting of the plate.

10. In a computing machine key operating means comprising a frame, a plurality of key stems mounted in the frame in generally parallel side by side relationship and adapted to be moved longitudinally for setting up the machine, a key finger button for each of the key stems

engaging the upper end thereof and adapted to be depressed to move the associated key stem longitudinally, the finger buttons being movable laterally relative to the key stems, a plate shiftable laterally on the frame and having openings therein through which the finger buttons slidably extend so that the plate will be shifted laterally by lateral movement of the finger buttons, operating means for the machine including a pair of operating parts adapted when moved to cause different operations of the machine, and means on the plate to engage and move one of the parts when the plate is shifted in one direction and the other of the parts when the plate is moved in the other direction.

11. Key operating means for a computing machine comprising a plurality of number key buttons in generally parallel side by side relationship, means mounting the key buttons for longitudinal setting up movement and for an additional operating movement different than the setting up movement and operating means for the machine including parts lying adjacent to the finger buttons to be engaged and moved by the finger buttons upon said additional operating movement of the finger buttons to operate the machine.

HAROLD C. FOX.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
913,307	Richards	Feb. 23, 1909
2,210,562	Anderson	Aug. 6, 1940
2,265,626	Butler	Dec. 9, 1941
2,350,979	Avery et al.	June 13, 1944
2,615,548	Hopkins	Oct. 28, 1952