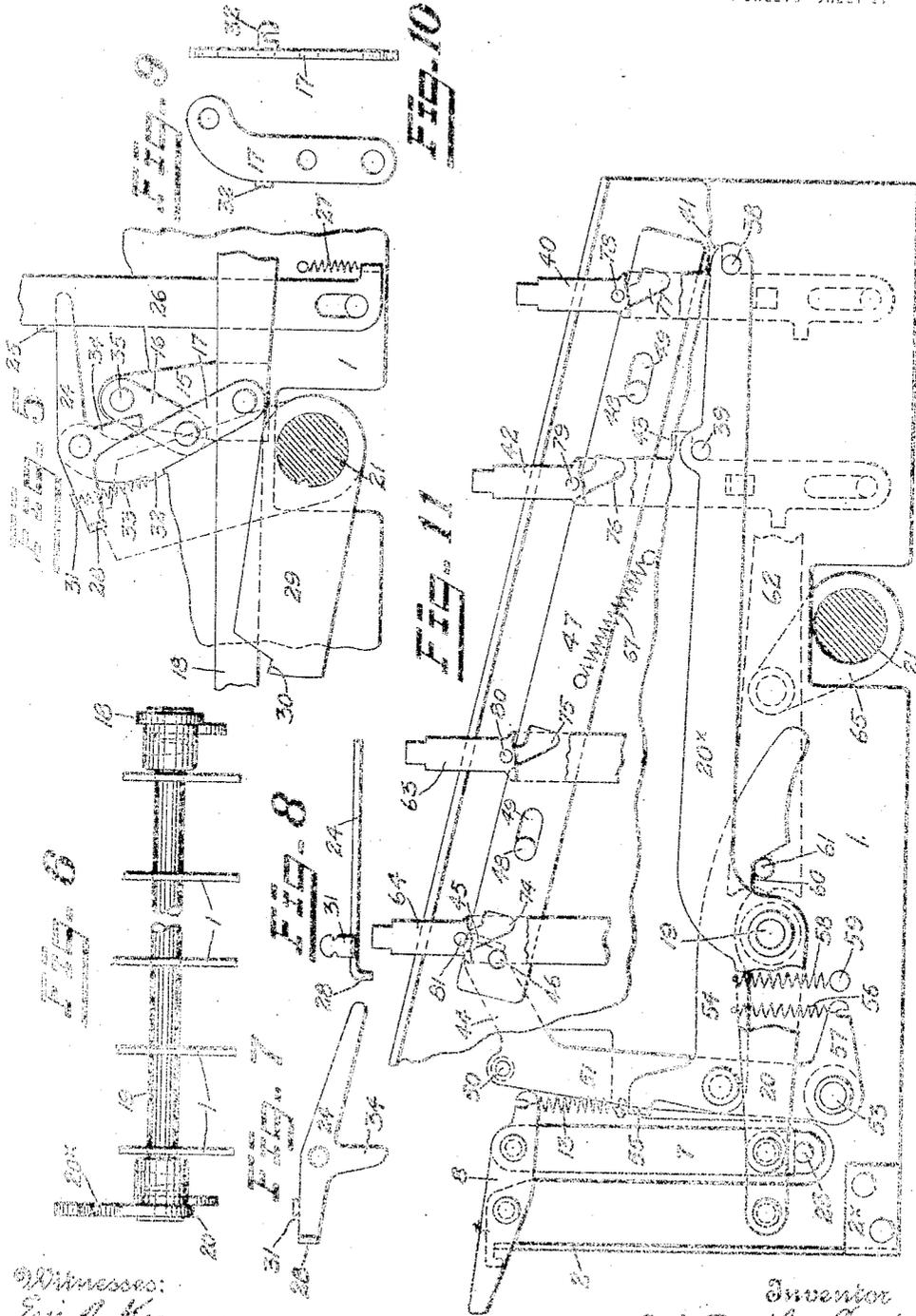


W. R. DE CAMP.
 KEYBOARD CONTROL FOR CALCULATORS.
 APPLICATION FILED NOV. 27, 1914.

1,166,878.

Patented Jan. 4, 1916.
 4 SHEETS - SHEET 2.



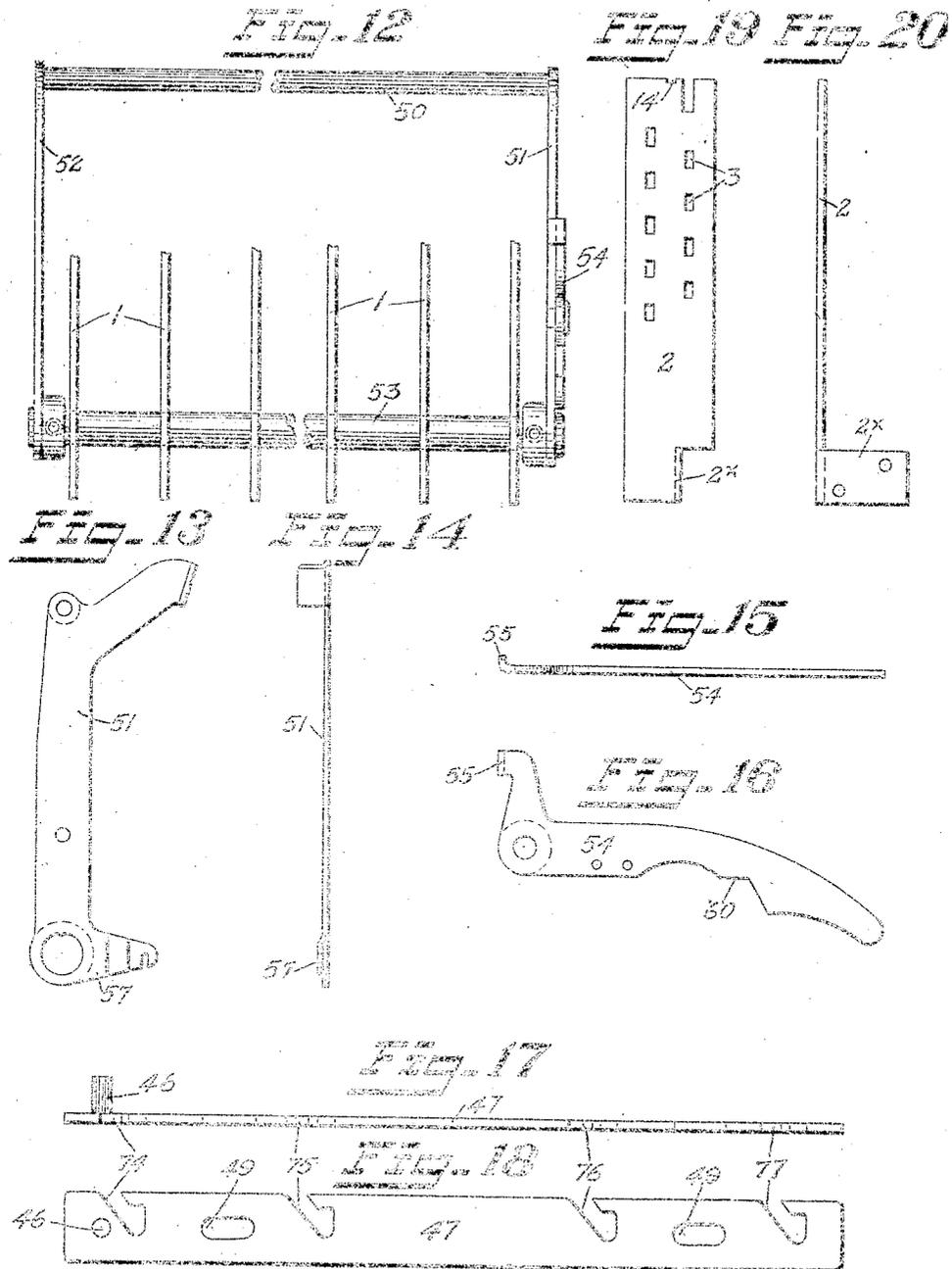
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 KEYBOARD CONTROL FOR CALCULATORS,
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4 SHEETS—SHEET 4.

FIG. 21

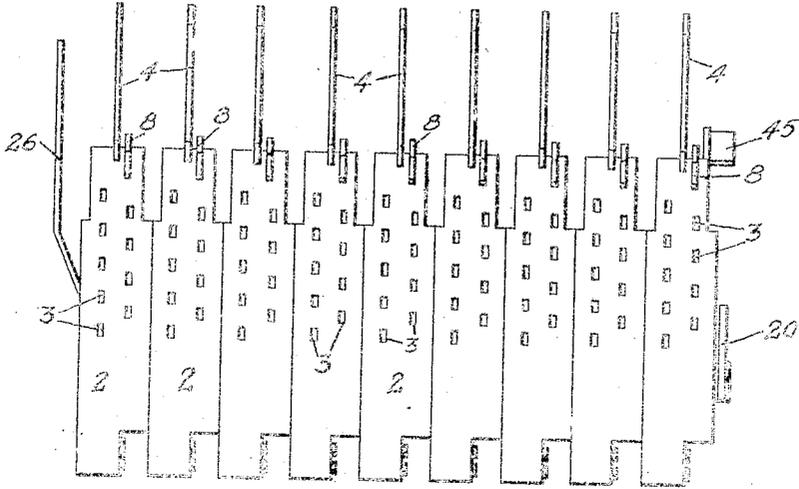
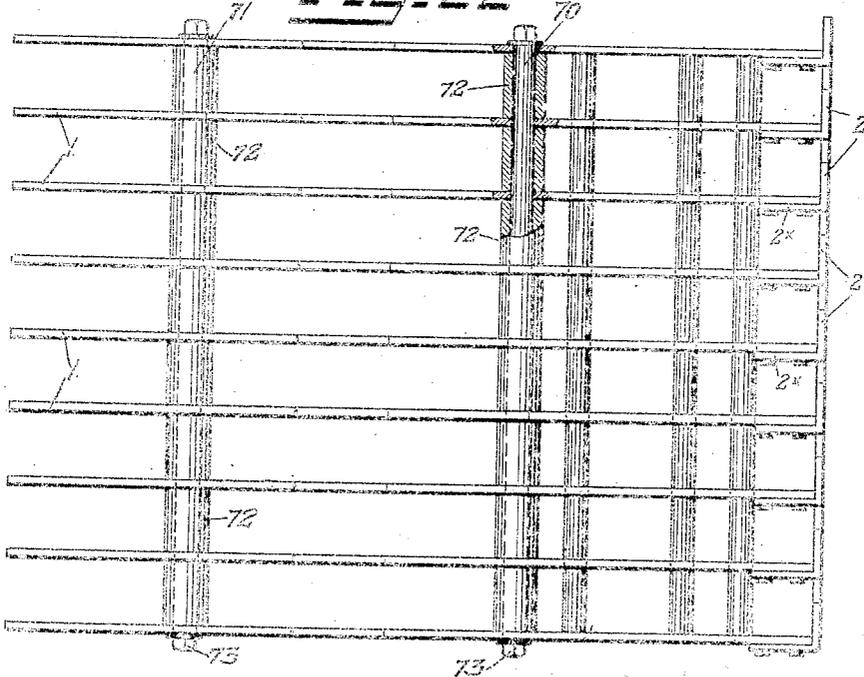


FIG. 22



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UNITED STATES PATENT OFFICE.

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KEYBOARD CONTROL FOR CALCULATORS.

1,166,973.

Specification of Letters Patent.

Patented Jan. 4, 1916.

Application filed November 27, 1914. Serial No. 874,145.

To all whom it may concern:

Be it known that I, WITSEL R. DE CAMP, a citizen of the United States, and a resident of Roseland, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Keyboard Control for Calculators, of which the following is a specification.

The object of the present invention is to provide improved means for causing the normal operation of the handle or power shaft of a calculating machine to restore the several members of the key-board, including the item keys, to their normal position for subsequent operation; and which means can readily be disabled upon depression of a repeat key, whereby any key or keys if they have been depressed, will remain positioned and cause such number to be added as often as the handle or power shaft is actuated. Such restoring means are further arranged to be operated by a special key, generally designated "error" key, so that when a number is set up and not to be used, the keys can be restored.

A further object of the invention is to cause actuation of such restoring means to be effected whenever one or more of the special keys of a machine are depressed or operated; such as the total, or sub-total key.

Another object of the invention is to provide improved means for causing the key-board members to be locked or disabled, upon the advance of a side bar or other member from the movement of the handle or power shaft; and which device contains a safety connection that will yield upon obstruction interfering with its proper action, and not cause injury of the machine at such a condition of affairs.

A further object of the invention is to provide a connection for the latter safety key-board lock, that as soon as its members are shifted, all of the special keys will be locked against movement.

Another object of the invention is to provide improved means for assembling the several parts relating to each bank of keys, on a carrying plate and extension, and for securing a series of these members in position, whereby upon removal of the securing means, each of the members relating to one

bank can be removed, yet all of its parts remain assembled on the plates, to be readily restored or reassembled when desired.

In the accompanying drawings showing embodiments of my invention, Figure 1 shows a side elevation with the restoring means in normal position. Fig. 2 is a similar-view with the parts in advanced position. Fig. 3 is a section on the line 3—3 of Fig. 1. Fig. 4 is a section on the line 4—4 of Fig. 1. Fig. 5 is a partial view similar to Fig. 1 with the parts in still another position. Fig. 6 is an elevation of the parts shown in Fig. 1. Fig. 7 is a side view, and Fig. 8 a plan, of the lever of the toggle device. Fig. 9 shows a side view, and Fig. 10 an edge view, of one link of the toggle device. Fig. 11 is a view similar to Fig. 1, from the opposite side of the machine. Fig. 12 is an end elevation of the key-board locking device. Fig. 13 is a side view, and Fig. 14 an edge view, of the locking device. Fig. 15 is a top view, and Fig. 16 a side view, of the cam lever. Fig. 17 is a plan, and Fig. 18 a side view of the locking bar for the special keys. Fig. 19 shows an elevation, and Fig. 20 a side view, of the guide plate for the stop bars. Fig. 21 is an elevation showing the stop bars assembled; and Fig. 22 is a plan view of the supporting plates with their guide plates, and locking means.

In the drawings, a supporting plate 1 is shown mounted vertically in the machine, and has a guide plate 2 at its rear end that contains nine slots 3, as indicated in Fig. 19. A series of these plates 1 are provided, one for each bank of keys, as shown in Figs. 21 and 22, and each of these plates carries nine keys 4; connected with which are nine stop bars 5, by means of bent levers 6, that pivot on opposite sides of the plate 1 alternately in succession. By this means four of the stop bars 5 are on one side of the plate, and five on the opposite side; as indicated by the staggered arrangement of the slots 3 in Fig. 19. With each set of these stop bars, cooperates a latch bar 7 carried by links 8 and 9 for vertical movement. Each latch bar is provided with a set of nine pins, alternately placed on opposite sides, to cooperate with a lug 10 on each of the stop bars 5. The lug 10 is vertical at its forward

edge, and inclined at its rear edge, so that when the key is depressed the stop bar will move rearward; as indicated by the bar 5* in Fig. 1, that will compress a spring 11 on the bar. The inclined face of the lug engaging one of the pins 12, will serve to hold the latch bar and tension a retracting spring 13, so that when the lug passes the pin the latch bar will fall to former position. It will be obvious that if the latch bar 7 is raised, the pin will release the lug 10 and the spring 11 will move the stop bar forward and raise the depressed key.

The parts just described do not form the basis of the present application, but the object is to provide means for raising all of the latch bars 7 at each operation of the machine, or when desired, that will result in restoring all of the stop bars and connected keys that have been operated.

On a suitable stationary part of the machine, conveniently on the plate 1, is fixed a supporting bracket 15, that carries a toggle joint device. This comprises a short link 16 pivoted on the bracket 15 by one end, whose other end is pivoted to a long link 17, preferably at the middle portion thereof. The lower end of the link 17 is pivoted on a rock bar 18 that swings on an axis, that is shown in the form of a shaft 19 extending across the machine and to which the bar 18 is secured, to rock this shaft. On the other end of shaft 19 is a bar 20, and these two side bars have extensions between which is secured a rod 23 extending across the machine below all of the latch bars 7. It will be understood that when the toggle formed of the links 16 and 17 move toward alignment from the position of Fig. 1, the bar 18 will rock the shaft 19 to raise the cross rod 23, and lift all of the latch bars; and when released the latch bars will move downward by their respective springs 13, and will swing the side bars to former position to further bend the toggle joint.

At the upper end of the long link 17 of the toggle is pivoted a lever 24 (see Figs. 7-8), whose rear end extends under a lug 25 projecting outward from a key 26, that is suitably guided for vertical movement, and which is retracted on depression by spring 27. The lever 24 at its forward end has a stop in the form of a bent ear 28, that lies in the vertical plane of a suitable actuating member. As shown, an arm 29 is carried by the main shaft 21 of the machine that is rocked at each operation of the machine. The arm 29 has an abutment 30 on its upper end that will engage an ear 28 on the lever. The lever 24 is provided with means such as a spring for moving the ear downwardly, until the rear end of the lever engages the lug 25; the lever 24 having an ear 31, between which and a lug 32 on the long link 17 is stretched a spring 33. The lever 24 is

also provided with an arm 34 projecting downwardly and adapted to strike a stop pin 35, that may be the pivot of the link 16.

The operation of the toggle device is as follows: The rock arm 29 is normally in the position indicated in Fig. 1, and in the operation of the machine the arm swings forward from this position, to that indicated in Fig. 5. When the rock arm swings forward and is then returned, the abutment face 30 on the rock arm will strike the ear 28, as the lever 24 is held in this position by its spring drawing the rear end against the lug 25 on the repeat key 26; as indicated in Fig. 5. Upon the rock arm striking this ear and moving farther rearward, it will cause a movement bodily of this lever to the rear, and the long link 17 pivoted to the lever 24 will have its upper end carried to the rear. Hence, it will swing on its pivotal connection with the rock bar 18, as well as on its connection with the short link 16. This will have an effect of moving the toggle formed by the two links toward alignment, and since the link 17 swings on a fixed pivot, the long link must move downward at its connection with the bar 18, and move the latter downward. This movement will therefore rock the shaft 19 and shift all of the latch bars 7, to restore the stop bars and keys. But during the latter portion of the rearward movement of the rock arm 29, the arm 34 of the lever 24 will engage the stop pin 35, that will swing lever 24 on the long link, and the front portion with the ear 28 will move upwardly to disengage the face 30 of the rock arm 29. This will therefore relieve the lever 24 from the pressure moving it rearward, and the springs on the latch bars now moving them downwardly, will rock the shaft 19 and raise the forward end of bar 18, which will tend to further bend the toggle links and return them to normal position; as indicated in Fig. 1. But the ear 28 on the lever having passed the abutment face 30, will now ride on the top edge or end of the rock arm 29, as soon as the arm 34 of the lever moves forward beyond the stop pin 35, by pressure of the spring 33.

It will be understood that when the rock arm 29 moves forward from this position of Fig. 1, to that indicated in Fig. 5, the spring 33 will rock the lever 24 until its rear end strikes the lug 25 on the key stem 26, as indicated in Fig. 5. It will also be understood that when the key stem 26 is depressed, its lug 25 will swing the lever 24 so that the ear 28 is raised and held away from position for engagement with the face 30 of the rock arm 29. As long as this key is held in this position, the stop arm can swing without engaging the lever 24, and therefore the restoring mechanism is disabled.

Another key stem 36 is provided having an ear 37 arranged to engage the forward

end of the bar 18; and depression of this key will rock the bar and shaft 19, to shift all of the latch bars and restore the key-board, in the manner described.

5 At the opposite side of the machine the bar 20 is shown provided with an extension 20* that projects forwardly, and is provided with stops 38 and 39. A total-key is indicated by a stem 40, which is provided with
10 an extension 41, that will strike the stop 38 when this key is depressed, and restore the key-board. The key-stem 42, that may be a sub-total key, is provided with an ear 43 arranged to strike the stop 39 and swing the
15 arm and shaft 19 whenever this key is depressed, and restore the key-board parts.

Means are provided for locking the key-board against operation, in the form of a rod 50, carried by arms 51 and 52, (see Figs. 20 11-14), that are fast on a rock shaft 53, suitably journaled in the machine. The rod 50 is moved rearward over the top of the latch bars 7, and will prevent their elevation, and hence no stop bar can move rearward, nor can any key be depressed. Upon
25 the arm 51 is pivoted a cam lever 54, having an ear 55 (see Figs. 15-16), that is pressed against the rear edge of the arm 51 by a spring 56, stretched between the cam lever and an extension 57 on the arm 51. A
30 spring 58 connected between the lever 54 and a fixed pin 59 tends to move the arm 51 forward and draws the lever 54 down with its cam face 60 normally in the path of a
35 pin 61 on a side bar 62, that is rocked by arm 65 on shaft 21. This side bar is reciprocated at each operation of the machine and its pin 61 moving forward will swing the lever 54 upwardly. This will swing the arm
40 51 rearward rocking the shaft 53, to carry the rod 50 rearward over the top of the latch bars 7. By reason of the shape of the cam lever the rod is held in this position above the latch bars until the return of the side bar
45 when the cam lever is released, and is drawn downward by its spring 58. But if for any reason the latch bars are shifted when the rod 50 is moved rearward to take a position above the latch bars, and hence an obstruction is offered, the cam lever 54 will swing
50 at its pivotal connection with the arm 51, by stretching the spring 56. Thereby a yieldable connection is provided that will prevent injury to the parts of the machine. This locking device for the key-board is
55 also arranged to lock or prevent operation of the special keys on the machine, such as the total or subtotal keys 40 and 42. This mechanism may also lock two special keys
60 such as a non-add key 63, and a non-print key 64.

As shown the arm 51 is provided with an extension 44 having an offset or ear 45. On the supporting plate 1 are arranged a pair
65 of pins 48, that engage the slotted portions

49 of a bar 47, that is thereby slidably supported. This bar is provided with a series of slots 74, 75, 76 and 77, that normally lie just below pins 78, 79, 80, and 81 on the four special keys 40, 42, 63, and 64 respectively. A pin 46 on the bar 47 normally
70 lies adjacent the ear 45 on the arm 51, so that as soon as the side bar 62 starts forward and the arm 51 is swung rearward through the cam lever, the bar 47 will be moved rearward, and the four pins on these special
75 key-stems will no longer register with the slots, but will lie adjacent the straight upper edge of the bar 47. This will prevent the depression of any one of these special keys, after the side bar has commenced its forward movement, and until the side bar returns to normal position. But when any
80 of these special key-stems are depressed, the pin thereon will strike the inclined edge of the slot to move the bar rearward, the bar being retracted by a spring 67. And this will result in the pins on the other three keys being adjacent the straight edge of the
85 bar and hence none of them can be depressed. It will thus be understood that this bar performs a double function of a locking device, serving to lock all of the special keys as soon as the side bar is shifted; and also
90 serving to lock the other three keys when any one of the special keys is depressed.

In Figs. 21 and 22 the manner of assembling and securing a set of nine of the supporting plates 1, is illustrated. Each of these supporting plates is provided with a
95 hook 22 at the upper end of its rear edge, that enters a slot 14 in the upper edge of the guide plate 2. At its lower end the plate 2 has a bent arm 2*, that engages the side of the supporting plate 1, and is permanently
100 secured thereto as by rivets. By this means it will be seen that the guide plate 2 is secured transversely at the rear end of the supporting plate, with the two rows of staggered guide slots 3, disposed on opposite
105 sides of the supporting plate, in proper position to receive the two sets of stop bars 5, carried at the sides of the supporting plate. When these nine members are brought together, the end guide plates 2
110 will abut at their adjacent side edges. Suitable securing means are provided for locking the plates in position in parallelism. As shown a pair of locking rods 70 and 71 are passed through suitable holes in the
115 plates 1, and sleeves 72 are placed on the rods 70 and 71 to hold the supporting plates spaced the proper distance apart. It will be understood that by removing one of the nuts 73, on each of the locking rods 70 and
120 71, the rods can be removed, and the nine supporting plates will thereby be free for removal. As stated, each of the plates has mounted thereon the nine bent levers 6, to which are connected the stop bars 5, pass-
125 130

ing through the slots in the guide plates 2; to which bent levers are pivoted the nine key stems 4. Therefore, these nine supporting plates when removed will retain all of these said members, and when re-assembled, such members will be in operative positions.

Having thus described my invention what I claim is:

10 1. In an adding machine, the combination with a key board including keys connected with stop bars, and latch bars controlled by the stop bars, and a rock shaft, of means for shifting the latch bars to restore the stop bars and keys, comprising a pivoted bar, means connected with the bar arranged to shift all of the latch bars, a link having at one end a stationary pivot, a second link pivoted by one end to said pivoted bar and pivotally connected with said link, a lever pivotally mounted on the second link and provided with an ear, and an arm carried by said rock shaft arranged to strike said ear and shift the lever to move the links toward alinement and thereby swing the said pivoted bar to restore the latch bars.

2. In an adding machine, the combination with a key board including keys connected with stop bars, and latch bars controlled by the stop bars, and a rock shaft, of means for shifting the latch bars to restore the stop bars and keys, comprising a pivoted bar, means connected with the bar arranged to shift all of the latch bars, a link having at one end a stationary pivot, a second link pivoted by one end to said pivoted bar and pivotally connected with said link, a lever pivotally mounted on the second link and provided with an ear, an arm carried by said rock shaft arranged to strike said ear and shift the lever to move links toward alinement and thereby swing the said pivoted bar to restore the latch bars, an arm on said lever, and a stop positioned to be engaged by said latter arm when the swinging arm has shifted the lever, to cause the lever to swing and move its ear out of engagement with the arm.

3. In an adding machine, the combination with a key board including keys connected with stop bars, and latch bars controlled by the stop bars, and a rock shaft, of means for shifting the latch bars to restore the stop bars and keys, comprising a pivoted bar, means connected with the bar arranged to shift all of the latch bars, a link having at one end a stationary pivot, a second link pivoted by one end to said pivoted bar and pivotally connected with said link, a lever pivotally mounted on the second link and provided with an ear, an arm carried by said rock shaft arranged to strike said ear and shift the lever to move the links toward alinement and thereby swing the said pivot

bar to restore the latch bars, and a repeat key having an abutment arranged to engage said lever when the key is shifted to shift the lever to hold its ear out of position for engagement with said arm on the rock shaft.

4. In an adding machine, the combination with a key board including keys connected with stop bars, and latch bars controlled by the stop bars, and a rock shaft, of means for shifting the latch bars to restore the stop bars and keys, comprising a pivoted bar, means connected with the bar arranged to shift all of the latch bars, a link having at one end a stationary pivot, a second link pivoted by one end to said pivoted bar and pivotally connected with said link, a lever pivotally mounted on the second link and provided with an ear, an arm carried by said rock shaft arranged to strike said ear and shift the lever to move the links toward alinement and thereby swing the said pivoted bar to restore the latch bars, a repeat key provided with a shoulder arranged to be engaged by said lever, and a spring connected between the lever and second link to draw the ear thereon against the rock shaft arm.

5. In an adding machine, the combination with a key board including keys connected with stop bars, and latch bars controlled by the stop bars, and a rock shaft, of means for shifting the latch bars to restore the stop bars and keys, comprising a pivoted bar, means connected with the bar arranged to shift all of the latch bars, a link having at one end a stationary pivot, a second link pivoted by one end to said pivoted bar and pivotally connected with said link, a lever pivotally mounted on the second link and provided with an ear, an arm carried by said rock shaft arranged to strike said ear and shift the lever to move the links toward alinement and thereby swing the said pivoted bar to restore the latch bars, a repeat key provided with a shoulder arranged to be engaged by said lever, a spring connected with said lever to draw the ear thereon against the rock shaft arm and to shift the lever to engage the key shoulder when the arm is swung away from the ear to limit the movement of the arm at said time, said key and shoulder when advanced serving to swing and hold the lever with its ear out of position for engagement with the rock shaft arm.

6. In an adding machine, the combination with a key board including keys connected with stop bars, and latch bars controlled by the stop bars, and a rock shaft, of means for shifting the latch bars to restore the stop bars and keys, comprising a pivoted bar, means connected with the bar arranged to shift all of the latch bars, a link having at one end a stationary pivot, a second link

5 pivoted by one end to said pivoted bar and
 pivotally connected with said link, a lever
 pivotally mounted on the second link and
 provided with an ear, an arm carried by
 10 said rock shaft arranged to strike said ear
 and shift the lever to move the links toward
 alinement and thereby swing the said piv-
 oted bar to restore the latch bars, a repeat
 key provided with a shoulder arranged to
 15 be engaged by said lever, a spring connected
 with said lever to draw the ear thereon
 against the rock shaft arm and to shift the
 lever to engage the key shoulder when the
 arm is swung away from the ear to limit the
 20 movement of the arm at said time, said key
 and shoulder when advanced serving to
 swing and hold the lever with its ear out
 of position for engagement with the rock
 shaft arm, an arm on said lever, and a stop
 25 positioned to be engaged by said latter arm
 when the rock shaft arm has shifted the
 lever, to cause the lever to swing and move
 its ear out of engagement with the rock
 shaft arm.

7. In an adding machine, the combination
 with a key board including keys connected
 with stop bars, and latch bars controlled
 by the stop bars, and a rock shaft, of means
 30 for shifting the latch bars to restore the
 stop bars and keys, comprising a shaft extending
 across the machine, a bar secured to each
 end of said shaft, a rod connected
 with said latter bars arranged to engage the
 35 latch bars when said bars and shaft are
 swung, a link mounted at one end on a sta-
 tionary pivot, a second link pivoted by one
 end to one of said pivoted bars, the second
 link being pivotally connected with said
 40 link, a lever pivotally mounted on the sec-
 ond link and provided with an ear, an arm
 carried by said rock shaft arranged to strike
 said ear to shift the lever to move said links
 toward alinement and thereby swing the
 45 connected bar to restore the latch bars, and
 a key connected with the other of said bars
 to restore the latch bars.

8. In an adding machine, the combination
 with a key board including keys connected
 with stop bars, and latch bars controlled by
 50 the stop bars, and a rock shaft, of means for
 shifting the latch bars to restore the stop
 bars and keys, comprising a shaft extending
 across the machine, a bar secured to each
 end of said shaft, a latch connected with
 55 said latter bars arranged to engage the latch
 bars when said bars and shaft are swung, a
 link mounted at one end on a stationary pivot,
 a second link pivoted by one end to one
 of said pivoted bars, the second link
 60 being pivotally connected with said link, a
 lever pivotally mounted on the second link
 and provided with an ear, an arm carried
 by said rock shaft arranged to strike the ear
 on said arm to shift the arm to move said
 65 links toward alinement thereby swinging

the connected pivoted bar to restore the
 latch bars, a repeat key provided with a
 shoulder arranged to be engaged by said
 lever, a spring connected with said lever
 70 to draw the ear thereon against the rock
 shaft arm and to shift the lever to engage
 the key abutment when the arm is swung
 away from the ear to limit the movement
 of the arm at said time, said key and
 75 shoulder when advanced serving to swing
 and hold the lever with its ear out of position
 for engagement with the rock shaft
 arm, and a special key connected with the
 other of said pivoted bars to restore the
 latch bars when operated.

9. In an adding machine, the combina-
 tion with a key board including keys con-
 nected with stop bars, and latch bars con-
 trolled by the stop bars, and a rock shaft,
 of means for shifting the latch bars to re-
 80 store the stop bars and keys, comprising a
 shaft extending across the machine, a bar
 secured to each end of said shaft, a rod
 connected with said latter bars arranged to
 engage the latch bars when said bars and
 85 shaft are swung, a link mounted at one end
 on a stationary pivot, a second link pivoted
 by one end to one of said pivoted bars, the
 second link being pivotally connected with
 90 said link, a lever pivotally mounted on the
 second link and provided with an ear, an
 arm carried by said rock shaft arranged to
 strike said ear to shift the lever to move
 said links toward alinement and thereby
 95 swing the connected bar to restore the latch
 bars, a repeat key provided with a shoulder
 arranged to be engaged by said lever, a
 spring connected with said lever to draw
 the ear thereon against the rock shaft arm
 and to shift the lever to engage the key
 100 shoulder when the arm is swung away from
 the ear to limit the movement of the arm
 at said time, said key and shoulder when
 advanced serving to swing and hold the
 lever with its ear out of position for en-
 105 gagement with the rock shaft arm, an arm
 on said lever, and a stop positioned to be
 engaged by said latter arm when the rock
 shaft arm has shifted the lever, to cause
 the lever to swing and move its ear out of
 110 engagement with the rock shaft arm, and a
 key connected with the other of said piv-
 oted bars to restore the latch bars.

10. In an adding machine, the combina-
 tion with a key board, and an actuating
 120 member, of a restoring device for the key
 board including a pair of links organized
 to operate as a toggle joint, a member con-
 necting the actuating member with one of
 said links, said connecting member being
 125 movably carried by one of the connected
 members, and means for shifting the con-
 necting member on its supporting member
 at an intermediate portion of the movement
 of the actuating member whereby to free
 130

the links from further advance by the actuating member.

11. In an adding machine, the combination with a key board, and an actuating member, of a restoring device for the key board including a pair of links organized to operate as a toggle joint, a member adapted to connect the actuating member with one of said links, said connecting member being movably carried by one of the said members it serves to connect, means for shifting the connecting member on its supporting member at an intermediate portion of the movement of the actuating member whereby to free the links from further advance by the actuating member, and a repeat key arranged to temporarily disable the restoring device.

12. In an adding machine, the combination with a key board, and an actuating member, of a restoring device for the key board including a pair of links organized to operate as a toggle joint, a member adapted to connect the actuating member with one of said links, said connecting member being movably carried by one of the said members it serves to connect, means for shifting the connecting member on its supporting member at an intermediate portion of the movement of the actuating member whereby to free the links from further advance by the actuating member, and a repeat key arranged to engage the connecting member to hold it out of position for causing connection between the actuating member and the link.

13. In an adding machine, the combination with a key board, and an actuating member, of a restoring device for the key board including a pair of links organized to operate as a toggle joint, a connecting member pivoted on one of said links and arranged to be engaged by the actuating member to operate the links and the restoring device, and a stop arranged to be engaged by said connecting member during the advance of the actuating member to free the connecting member from the actuating member during the movement of the actuating member.

14. In an adding machine, the combination with a key board, and an actuating member, of a restoring device for the key board including a pair of links organized to operate as a toggle joint, a connecting member pivoted on one of said links and arranged to be engaged by the actuating member to operate the links and the restoring device, a stop arranged to be engaged by said connecting member during the advance of the actuating member to free the connecting member from the actuating member during the movement of the actuating member, and a repeat key arranged to engage the con-

necting member and hold it out of position for engagement with the actuating member.

15. In an adding machine, the combination with a key board, and a main operating member, of a locking member arranged to be directly engaged by said operating member to be moved over and lock the key board, said locking member including a yieldable connection that can shift upon obstruction being offered by the key board when the operating member effects its actuating movement.

16. In an adding machine, the combination with a key-board and an operating member, of a locking member arranged to shift over the key-board parts to disable the same, a cam arm pivoted on the locking member and having a stop, a spring between the locking member and the said arm to press the stop against the locking member, and an abutment on the operating member arranged to engage the cam arm to shift it and swing the locking member to locking position, said arm upon movement of the operating member shifting on the locking member when obstruction is offered by the key-board.

17. In an adding machine, the combination with a key-board and an operating member, of a locking member arranged to shift over the key-board to disable its parts, means on the operating member to shift the locking member, a series of special keys on the machine, a bar arranged when shifted to engage all of the special keys to lock them against movement, and means for shifting said bar to locking position by the said locking member when moved to disable the key-board.

18. In an adding machine, the combination with a key-board and an operating member, of a locking member arranged to shift over the key-board to disable its parts, means on the operating member to shift the locking member, a series of special keys on the machine, a bar arranged when shifted to engage all of the special keys to lock them against movement, means for shifting said bar to locking position by the said locking member when moved to disable the key-board, said locking member having a resilient connection whereby it can yield upon obstruction being offered when it is actuated by the operating member.

19. In an adding machine, the combination with a key-board and an operating member, of a locking member arranged to shift over the key-board to disable its parts, means on the operating member to shift the locking member, a series of special keys on the machine, a bar arranged to be shifted by any of the said special keys to lock the other said keys against movement and also arranged when shifted to lock all said keys

against movement, and means for shifting said bar to locking position by the said locking member when moved to disable the key-board.

5 20. In an adding machine, the combination with a key-board and an operating member, of a locking member arranged to shift over the key-board to disable its parts, means on the operating member to shift the
10 locking member, a series of special keys on the machine, a bar arranged to be shifted by any of the said special keys to lock the other said keys against movement and also arranged when shifted to lock all said keys
15 against movement, and means for shifting said bar to locking position by the said locking member when moved to disable the key-board, said locking member having a resilient connection whereby it can yield upon
20 obstruction being offered when it is actuated by the operating member.

21. In an adding machine, the combination of a key-board comprising a set of banks of key members, each bank being
25 composed of an upright plate, a set of keys mounted on the plate, a set of stop bars mounted on the plate and connected with the keys, each plate having on its rear end a guide plate secured transversely thereto and
30 provided with openings engaging the stop bars of the plate, whereby each said plate and attached guide plate form supporting and guide means for the stop bars, and also carry the keys and connecting means, said
35 members being normally assembled with the

guide plates extending in a plane in engagement at their side edges, and securing means extending through all of said plates, whereby upon removal of such means all of the supporting plates are free for removal without disturbing their said attached parts, and adapted for replacement upon reassembling of the said means.

22. In an adding machine, the combination of a key-board comprising a set of
40 banks of key members, each bank having an upright plate, a set of keys mounted on the plate, a set of stop bars mounted on the plate and connected with the keys, each plate having on its rear end a guide plate
45 secured transversely thereto and provided with openings engaging the stop bars of the plate, whereby each said plate and attached guide plate form supporting and guide means for the stop bars and also carry the
50 keys and connecting means, said members being normally assembled with the guide plates extending in a plane engaging at their side edges, locking rods extending through all of said plates, and spacing
55 sleeves on the rods between the plates, whereby upon removal of the rods all of the supporting plates are free for removal without disturbing their said attached parts, and are adapted for replacement upon reassembling of the said rods and sleeves.

WITSEL R. DE CAMB.

Witnesses:

E. M. SQUAVEY,

HAROLD A. ALFARTE.