

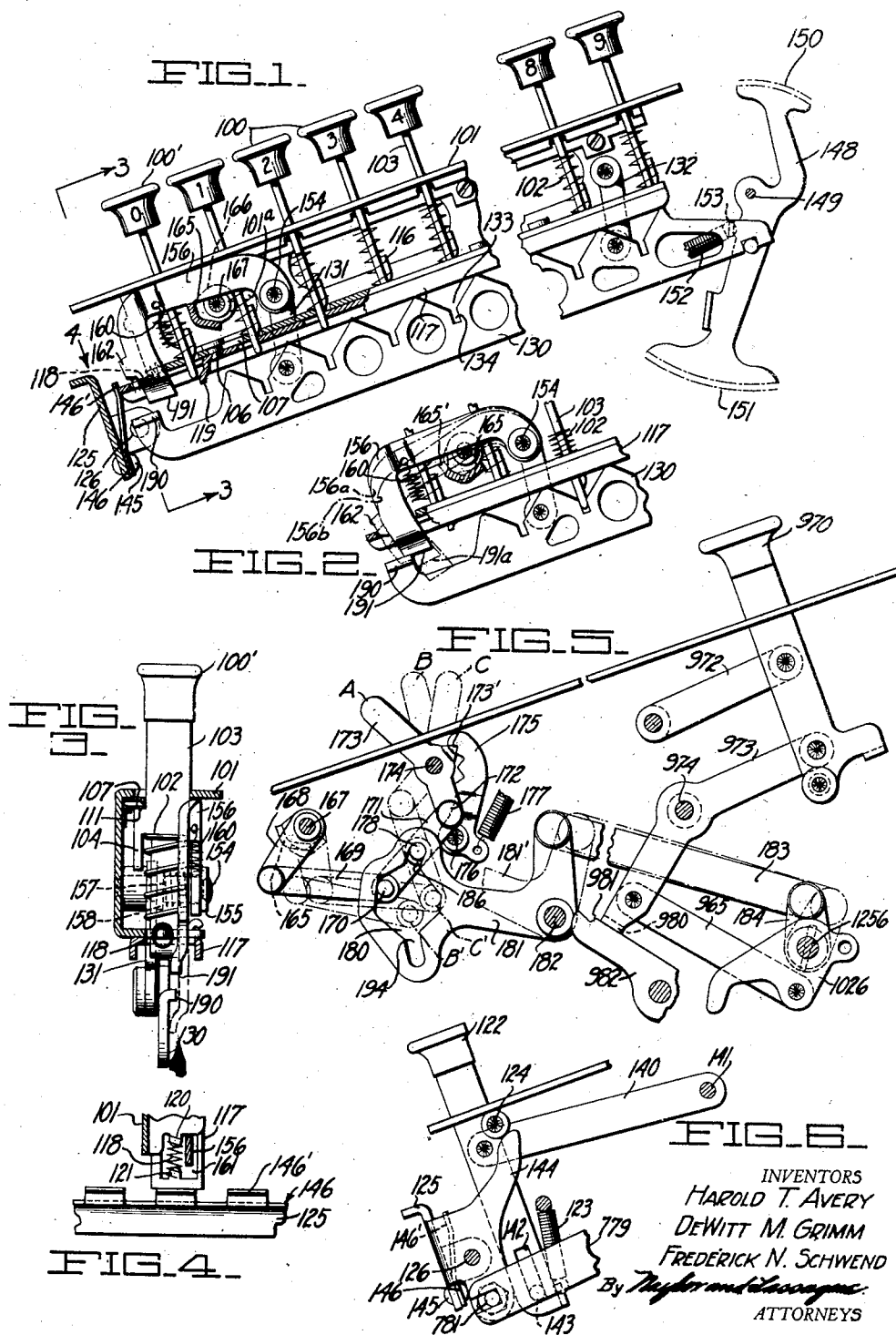
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CALCULATING MACHINE

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CALCULATING MACHINE

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This invention relates to calculating machines and has particular reference to an improved keyboard mechanism for calculating machines of the key-set type, such as disclosed in the patent to Harold T. Avery, Number 2,216,659, issued on October first, 1940.

The present invention is illustrated as applied to the Marchant calculating machine described in said patent and reference may be had thereto for a complete description of the machine, including mechanisms not specifically disclosed herein. However, it is to be understood that the invention is not limited to use in this machine but may be applied to any calculating machine wherein it is desired at certain times to prevent depression or release of any or all value keys.

In performing a series of machine calculations it often happens that certain digits or constants of a factor set up on the keyboard are later repeatedly used in setting up other factors for succeeding calculations and the successive clearance and reinstating of such constants in the keyboard obviously entail waste time and effort.

Accordingly, one object of the present invention is to selectively retain any factor or selected digits of said factor in the value entering mechanism of a calculating machine during an operation which otherwise would clear such factor.

Another object is to selectively prevent depression and release of keys in any key row of a keyboard in which value keys are depressed while permitting the keys in the remaining rows to be depressed and then released at will.

Another object is to permit control of a keyboard by a single manipulable member which is selectively settable to permit depression or release of all value keys in a keyboard, or to prevent such depression or release of all keys, or to prevent depression or release of all keys in the key rows in which value keys are currently depressed while permitting depression and release of all remaining keys.

Another object is to selectively set a keyboard control mechanism and to automatically supersede such setting during certain calculations.

Another object is to permit control of a keyboard by a single manipulable member selectively settable to permit depression and release of all value keys in a keyboard or to prevent depression and release of all keys in the key rows in which value keys are currently depressed while permitting depression and release of all remaining keys, and to automatically lock all keys against release and depression during an automatic calculation without disturbing the setting

of the manipulable member, so as to permit restoration of the keyboard to its previous condition at the end of such calculation.

The manner in which the above and other objects of the invention are accomplished will be readily understood on reference to the following specification when read in conjunction with the accompanying drawing, wherein:

Figure 1 is a side view, partly in section, of one bank or row of value selecting keys, illustrating, in part, the selective keyboard locking mechanism embodying the present invention.

Figure 2 is a fragmentary side view, similar to Figure 1, illustrating the keyboard locking mechanism in an alternative position.

Figure 3 is an enlarged transverse sectional view of one of the key banks and is taken substantially along the line 3—3 of Figure 1.

Figure 4 is a fragmentary plan view taken in the region indicated by the arrow 4 of Figure 1.

Figure 5 is a side view illustrating the selectively settable control means for the keyboard locking mechanism, and the means for superseding the manual control of the locking mechanism during an automatic division performance.

Figure 6 is a side view of the keyboard clear key mechanism.

The mechanism of the present invention provides a simple keyboard locking means capable of selectively functioning as a means for locking the entire keyboard or only part of the keyboard against clearance or entry of a value therein, thus making it possible to lock a constant in the keyboard for a succession of machine calculations while allowing other values to be set in the remainder of the keyboard and to be cleared after each problem, or to cause an entire factor to be locked in the keyboard against clearance until such time as it is desired to enter a new factor or to clear the keyboard. The mechanism is also capable of automatically preventing inadvertent clearance of a keyboard set-up during division, whether or not the manually settable keyboard lock control means is effective. Provision is also made for causing this control means to resume its original control of the keyboard lock mechanism upon termination of the division calculation.

In a machine designed for calculating in accordance with the decimal system, such as the one to which the mechanism of the present invention is applied, the keys are preferably arranged in a series of identical and juxtaposed banks of at least nine keys each, the number of banks depending upon the magnitude of the

factors with which the machine is designed to deal.

The construction of each of the key banks or sections is substantially the same as disclosed in the Avery Patent Number 2,255,909, issued on September sixteenth, 1941, and comprises the usual number of value keys 109, each of which is slidably mounted in a channel shaped key frame 101 fixed in the frame of the machine. Each key is normally maintained in a raised position by a compression spring 102, and the key stem 103 thereof is provided with a shoulder 111 (Fig. 3) which is adapted to engage a stop 107 mounted on the respective channel frame 101 to limit upward movement of the key, while a projection 104 on the key stem is adapted to engage the lower leg of the frame 101 to limit depression of the key.

All of the key stems are of the same length and each has a cam extrusion 116 which, upon depression of the key, pushes to the right, as viewed in Figure 1, a slotted key locking slide 117 slidably supported on the under side of the frame 101 by studs 106 extending through elongated slots 107 formed on the lower leg of the key frame. Upon full downward depression of any value key, with the exception of the leftmost or zero key 100', the locking slide 117, which is urged leftward by a spring 118 (Figures 1 and 4) extending between retaining fingers 120 and 121 on the frame and slide, respectively, snaps back into its initial location and by engaging over the upper end of the extrusion 116 latches the depressed key.

The leftmost key 100' in each section is the zero or clear key and is provided for the sole purpose of releasing any latched down value key in the same section. The stem 103 and extrusion 116 of this key are identical with the other keys of the section, but latching down of the same is prevented by the provision, on locking slide 117, of a lip 119, the lower edge of which lies below the lowest position assumed by the top of the extrusion 116. Hence, while the slide 117 is moved to the right upon depression of this key to release any other latched down key, the lip 119 prevents the slide from returning leftward during the depression of the zero key and latching thereof cannot be effected.

Master manual and automatic keyboard clearing means are provided which, under certain circumstances as set forth later, are capable of either simultaneously releasing every depressed key on the entire keyboard or selected ones of said keys.

Describing first the manual keyboard clearing means, a clear key 122 (Figure 6), which is normally maintained in a raised ineffective position by a spring 123, is guided for vertical movement by a link 140, pivoted at one end to the key stem of key 122, and at the other end on a frame pin 141, the lower end of the key stem being provided with a slot 142 embracing a second frame pin 143. A roller 124 is mounted on the key stem and overlies a curved finger 144 forming part of a keyboard clear bail 125, pivoted at its ends on frame pins 126.

Secured as by rivets 145 to the bail 125 is a leaf spring 146 (Figures 1, 4, and 6) having upwardly extending flexible fingers 146' formed thereon, and each aligned with a locking slide 117. Normally, the spring fingers 146' merely abut the juxtaposed ends of the respective locking slides 117 without exerting any pressure thereon. However, upon depression of the clear key 122,

the roller 124 rocks the finger 144 and bail 125 clockwise causing the spring fingers 146' to press against the slides 117. It should be noted that the fingers 146' are stronger than the springs 118 and, therefore, except under circumstances noted hereinafter, the spring fingers are capable of pushing the locking slides 117 to the right to release all depressed keys in the keyboard.

As described in detail in the above mentioned Avery Patent Number 2,216,659, means are provided for automatically clearing the keyboard during addition or subtraction operations, and it is possible to employ the same means for clearing the present keyboard. To this end a bar 779 (Figure 6), identical with the correspondingly numbered bar of said patent, is provided with a bifurcated end embracing a pin 781 on the finger 144. During an addition or subtraction operation, the bar 779 is automatically reciprocated to rock the finger 144 and thereby rock the key release bail 125 in the same manner as set forth hereinabove.

Disposed under each bank of value keys 1 to 9, inclusive, is a differentially settable bar 130 which is pivotally suspended from the corresponding key frame 101 by means of two parallel links 131 and 132. This bar 130 has nine identical V-notches 133 formed on the upper edge thereof, each of which merges at its bottom into a downwardly extending slot 134 adapted to receive the lower end of a corresponding key stem 103. The vertical center lines of the key stems 103 are spaced an equal distance apart. This distance, however, is slightly greater than the spacing between the successive equispaced slots 134 so that each succeeding slot 134 will be spaced one increment further away from its cooperating key stem. This spacing is so proportioned that depression of a value key will cam the bar 130 to the right, as viewed in Figure 1, a number of increments equal to the value represented by the depressed key.

Movement of each bar 130 is utilized to set up a mechanical representation of the selected value whereby the calculating mechanism may be accordingly controlled. For this purpose a swinging segment member 148 is pivotally mounted on a transversely extending shaft 149 supporting like members associated with other key banks. This member 148 is provided at opposite ends thereof with arcuate racks 150 and 151 which serve to transmit the movement of the differential bar 130 to different parts of the calculating mechanism and thus control the same accordingly.

However, when no value key of a key section is depressed, the respective bar 130 is held in its extreme leftward or ineffective position, as illustrated in Figure 1, by a tension spring 152 extending between an ear 153 on the segment member 148 and a portion of the machine frame (not shown). When a bar 130 is allowed to remain in this position during a machine operation no direct entry of a value will be effected in the corresponding order of the accumulator (not shown).

As mentioned hereinbefore, means are provided for locking any or all depressed keys to prevent their release, or for preventing depression of any or all keys. This locking means offers considerable flexibility in operation, being adapted to be set to lock a constant of any desired number of digits in any part of the keyboard while allowing the remainder of the keyboard to remain free to receive other digits and to be

cleared, or to lock the entire keyboard against entry or clearance of a value therein, or to automatically lock the keyboard against adventer or inadvertent entry or clearance of a value during division regardless of the manual setting of the locking mechanism without disturbing such manual setting.

Referring to Figures 1 and 3, a stud 154 forming the pivotal support for the forward parallel link 131 in each key section is secured to the wall of the channel frame 101 and has secured to its outer end the washer 155. A blocking lever 156 is loosely fitted over the stud 154 and is normally pressed against the washer 155 by a compression spring 157 (Figure 3) fitted over the stud and extending between the lever and a flange 158 formed on the stud. The bearing hole formed in the lever 156 and fitting over the stud 154 has sufficient clearance to allow a slight amount of sidewise rocking movement of the lever against the action of the spring 157, the reason for which will appear hereinafter, while a light tension spring 160 is tensioned between the lever 156 and the lower leg of the key frame 101. Spring 160 has enough strength to rock the lever 156 downwardly to the lowermost dot and dash line position 156b of Figure 2, against the frictional resistance created by the spring 157, if otherwise permitted to do so. However, if the lever 156 is of sufficient weight to rock downwardly of its own accord, the spring 160 may be omitted.

As shown in Figure 4, the outer depending leg of the lever 156 is formed to extend through an opening 161 in the key locking slide 117 and has a lobe 162 (Figures 1 and 2) formed thereon which, when the lever 156 is in an intermediate rocked position, as illustrated either by the full lines or the intermediate dot and dash lines 156a in Figure 2, lies directly behind the foremost edge of the opening 161 and thus renders the opposite spring finger 146' ineffective to move slide 117 by blocking rightward movement (Figure 1) of both the spring finger and the latching slide. It will be noted that when the lever is in this intermediate position, the lobe 162 not only prevents movement of the spring finger 146' sufficient to release any key but also performs the additional function of insuring that all keys in that key section will be locked in their current raised or depressed positions so that they cannot be released by the zero key 100' or any of the keys 100 of the row. If, under these conditions, the bail 125 is swung clockwise either manually or automatically in an attempt to move the slide, the respective spring finger 146' will merely yield.

Means operable in conjunction with the differentially settable bars 130 are provided to control the positions of the various blocking levers 156 and thereby to control the different locking functions mentioned hereinbefore. This means comprises a rockable bail 165 (Figures 1, 2 and 5) adapted to be set in any of three different positions to control the levers 156 accordingly. The bail 165 extends across the entire keyboard and passes through openings 101a in the walls of the various key frames 101. Ears 156 are formed on the opposite ends of the bail 165 and are pivoted on coaxial frame pins 167. One of the ears 166 (Figure 5) is suitably secured to an arm 168 connected by a link 169 to a lever 171 which is pivoted at 172 to a settable control lever 173. The lever 173 is pivoted on a frame stud 174 and has a portion thereof extending through a slot in the keyboard cover whereby it

may be manipulated by the machine operator into any one of three positions indicated at A, B, and C.

Detent means are provided to hold the settable lever 173 in any of its three positions and comprises a pawl 175 pivoted on a frame pin 176 and urged counter-clockwise by a spring 177 tensioned between the pawl and a frame stud (not shown). The pawl has three spaced notches formed thereon each of which is adapted to engage a projection 173' formed on the lever 173.

The lever 171 is provided with a pivot pin 178 intermediate its ends, which pin extends into an opening 180 in a combined camming and pivot lever 181 which is pivotally supported on a frame pin 182. The lever 181 is connected to a division initiating key 970 through a train of elements comprising a link 183, arm 184 fastened to a rockable shaft 1256 to which is also fastened a lever 1026, and a link 965 connecting the lever 1026 to a key supporting lever 973 pivoted on a frame pin 974. The lever 973 and a link 972 form a parallel link arrangement for guiding the key 970 in a substantially vertical direction during depression of the key or release thereof from depressed position.

The division key 970 is normally held in its illustrated raised position by spring means (not shown). However, upon depression thereof to a position wherein an ear 980 on the supporting lever 973 is engaged by a latching shoulder 981 of a spring pressed latch 982, a division operation will be initiated as described in detail in said Avery Patent Number 2,216,659. The division operation will automatically continue until it is terminated either automatically or by depression of a special "stop" key, at either of which times the latch 982 will be rocked down to allow the key 970 to again be spring raised to its upper position.

Assume for the present that the key 970 is allowed to remain in its illustrated raised position in which case the lever 181 is so positioned that a narrow upper guide slot 186, forming part of the opening 180 thereof, embraces the pivot pin 178, thereby forming a fulcrum for the lever 171.

With the lever 181 positioned, as illustrated, movement of the lever 173 to its "ineffective" position A will cause the lever 171 to rock about the axis of pin 178 and cause the link 169 and arm 168 to move bail 165 to its highest rocked lever, shown in Figures 1 and 5, and the bail will engage and rock each of the blocking levers 156 to the position shown in Figure 1 wherein its blocking lobe 162 is situated above the level of the associated locking slide 117 and, therefore, cannot prevent release or depression of any of the keys in the keyboard. The keyboard will therefore function in the usual manner.

Movement of the lever 173 to its intermediate or "full keyboard lock" position B will cause the lever 171 to rock on its pin 178 until its pivotal connection 170 assumes a position B' whereupon the bail 165 will be positioned at an intermediate height indicated by the dot and dash line 165' (Figure 2) and will hold all of the blocking levers 156 in the position illustrated by the dot and dash lines 156a. When in this position, the blocking lobes 162 on the levers 156 will be positioned in blocking relation with the forward edges of the openings 161 (Figure 4) of the key locking slides, thus preventing depression of any raised key or release of any depressed key. Therefore, any value set up on the keyboard and locked therein by movement of the lever 173 to its intermediate position B will be retained therein and cannot be

changed or cleared until the lever 173 is again rocked out of this position.

Movement of the lever 173 into its rearmost "keyboard-constant lock" position C will cause the lever 171 to rock on its pin 178 until the pivotal connection 170 assumes a position C', at which time the bail 165 will be moved to its lowermost possible position indicated by the full lines in Figure 2. When in such position, the springs 160 in all key sections of the keyboard in which no value key has been depressed will be allowed to rock their respective blocking levers 156 downward to their lowermost possible positions illustrated by the dot and dash lines 156b in Figure 2, carrying their blocking lobes 162 below the level of the locking slides 117 wherein they will be ineffective to prevent releasing movement of those slides. However, in those orders in which a key has already been depressed and latched in depressed position, before movement of lever 173 to position C, the key stem 103 thereof will have cammed the differentially settable bar 130 to the right, as viewed in Figures 1 and 2, an amount proportional to the value of the depressed key. Thus, an ear 190 formed on the bar 130 will be moved into blocking relation with the lowermost offset end 191 of the blocking lever 156 and will prevent movement thereof below its intermediate blocking position shown in full lines in Figure 2.

It should be noted that the ear 190 is so arranged on the bar 130 that when the bar is held in its "zero" position, illustrated in Figure 1, by the spring 152, the ear 190 will not interfere with movement of the blocking lever 156, and it is only when the number "1" or higher value key is depressed that the ear 190 is moved into blocking relation with the corresponding blocking lever 156, such a situation being illustrated in Figure 2 wherein the number "2" value key is depicted as latched in depressed position.

It will be seen from the above that a value or constant may be locked indefinitely in the keyboard while permitting other values to be set in the keyboard and then cleared in the usual manner. This may be accomplished by first setting the lever 173 in its ineffective position A, if it is not already there, and then setting up the value or constant which it is desired to retain indefinitely. Thereafter, the lever 173 is moved to its "keyboard-constant lock" position C and, consequently, the blocking levers 156 in those orders in which no value key has been depressed will drop to their lowermost ineffective positions wherein the offsets 191 will be located below the ears 190 as illustrated in dotted lines in Figure 3, thereby permitting free movement of the respective differential bars 130, while the blocking levers in those orders in which a key is depressed and latched will be blocked by the ears 190 of the respective differential bars 130, thereby holding such levers in blocking relation with the corresponding key locking slides 117. However, in the event that all of the keys are in raised position prior to such setting and locking of a value in the keyboard or in the event that it is desired to set and lock a value in the keyboard in addition to a constant already locked in the keyboard, the lever 173 may be left in position C during the depression of the keys to be locked. The lever 173 would then be moved to its position A and thence back to position C, resulting in all of the depressed keys being locked in depressed position.

During such movement of the lever 173, value keys will be standing in a depressed position in key sections wherein the blocking levers 156 were

originally allowed to drop to their lowermost positions. The blocking ears 190 of the corresponding differential bars 130 will, therefore, be situated over the offset ends 191 of the blocking levers 156, and as the control lever 173 is rocked to position A, the inclined left surface (Figure 3) of the offsets 191 on the levers 156 will merely cam the levers sideways as they pass upward past the ears 190. At this time, the springs 157 on the pivot studs 154 will merely yield until the offsets 191 pass above the ears 190 at which time the springs 157 will snap the levers 156 into their original illustrated vertical planes, again positioning the offsets 191 directly over the paths of movement of the ears 190. When it becomes desirable to release any key or keys locked in depressed position, the lever 173 is merely moved back to its ineffective position A and any of the several clearing means operated to release the keys.

Depression of the division key 970 to initiate a division operation will cause the bail 165 to assume its intermediate "full keyboard lock" position 165' (Figure 2) regardless of the setting of the lever 173 and without changing such setting, and will therefore lock the entire keyboard. When the division key is allowed to rise at the completion of the division operation, the keyboard will again be restored to the particular locked or unlocked condition previously determined by the setting of the lever 173. To this end, the opposite edges of the opening 183 in the lever 181 converge into a narrow slot 194 capable of embracing the pivot pin 170 extending from the lower end of the lever 171. The opening 180 in lever 181 is so formed that, upon depression of the division key 970 to its lowermost latched position and consequent upward rocking movement of the lever 181 to the position illustrated in part by dot and dash lines 181' (Figure 5), the upper converging sides of the opening 180 will free the pivot pin 178 on lever 171, while the lower converging sides of the opening will cam the lower pivot pin 170 into the narrow guide slot 194. This slot is arranged so as to locate the pin 170 substantially in the position B' regardless of the setting of the lever 173, and therefore the bail 165 will be moved to its intermediate position 165' (Figure 2) to hold all of the blocking levers 156, with the exception of any such levers which have been blocked in the full line position indicated in Figure 2 in the manner described hereinbefore, in their blocking positions 156a. It should be noted that this latter position 156a is below the full line position illustrated in Figure 2 and, therefore, the bottom offset edge 191 of such levers will be located at 191a which is below the upper edge of the blocking ears 190 of the differentially settable bars 130.

Upon termination of the division operation, the division key will be spring pressed upwardly to its original position and the lever 181 will re-assume the lower position in which it is shown in full lines, during which time the lower converging edges of the opening 180 will free the pin 170 while the upper converging edges of the opening will cam the pin 178 into the slot 186, causing the lever 171 and bail 165 to assume their originally set positions in accordance with the setting of the lever 173. Of course, if the lever 173 was originally set at "B" before depression of the key 970, movement of the camming lever 181 from its normal position and back again will not cause movement of the lever 171 or the ele-

ments (including bail 165) connected thereto. If, however, the lever 173 was originally set at "C," automatic release of the division key 970 to its raised position at the end of division with consequent rocking of the bail 165 from the dot and dash line position, indicated at 165' of Figure 2 to its full line position therein, will allow those blocking levers 156 which are not blocked by the corresponding ears 190 to resume their lowermost unblocking positions 156b (Figure 2) which they occupied before the depression of the division key 970. Therefore, movement of the key 970 to its raised position will effect restoration of the keyboard to the same locked or unlocked condition that it occupied prior to the division operation.

Examples of operations capable of being effected by the keyboard locking mechanism will clearly illustrate the advantages of the present invention.

In a series of calculations, successively entered factors contain a constant value in conjunction with a variable value, the operator, instead of clearing the keyboard and then entering the constant and the variable value prior to each calculation, may first lock the constant in the keyboard as described hereinbefore, preferably by first setting the lever 173 to position A, then setting up the constant on the various value keys, and thereafter setting the lever 173 to position C. Now the variable value may be set up on the value keys and after the first calculation the master clearance bail 125 is operated either manually by depression of the clearance key 122 or automatically, resulting in the variable value being cleared while the constant remains locked in the keyboard. Obviously, only the variable value of the next factor need be set up in the keyboard preparatory to the next calculation, thereby saving the amount of time and effort otherwise expended in recurrently setting up the constant value.

Problems in proration may be conveniently performed with the aid of the mechanism of the present invention. For example, in percentage proration, that is determining the percentage that each of a series of values bears to the sum of the values being prorated, the sum may be set up in the right hand portion of the keyboard and should be locked therein by the prescribed manipulation of the settable lever 173 to position C. One of the values to be prorated is then set up in the left hand portion of the keyboard. The values are then added into the accumulator (not shown) in the well known manner by depression of the add key (also not shown). At this time the clearance bail 125 is rocked in the usual manner clearing the value being prorated from the keyboard while the sum of the values remains locked in the keyboard. Such sum, as now entered in the accumulator, is cleared therefrom by operating the machine in subtraction leaving only the value to be prorated remaining in the accumulator and the sum of the values being prorated in the keyboard. The machine is thereupon operated in division in the usual manner dividing the value in the accumulator by the sum set up in the keyboard to obtain the percentage rating. In determining the percentage rating of the remaining values in the series the setting of the sum in the right hand portion of the keyboard need not be disturbed and only the particular value for which the rating is being determined need be set in the keyboard.

Interest calculation may also be expedited by the employment of the present invention. For

example, in figuring interest on savings bank accounts assuming that interest for each month is payable on the lowest balance in the account during the month, the interest factor, i. e., the interest per dollar per month at the specified rate, is set up and locked in one portion of the keyboard by the proper manipulation of the lever 173 to position C. The lowest balance of a particular account for the first month from which interest accrues is then set up in another portion of the keyboard and the machine is operated in addition, adding both the balance and the interest factor into the accumulator. The bail 125 is operated at this time to clear the balance from the keyboard while the interest factor remains set in the keyboard. The lowest balance in the account during the next following month is then set in the keyboard and such balance and the interest factor are again added into the accumulator, and so on for the remaining months of the period. When the balance for the last month for which interest is being computed has been added into the accumulator the sum of such balances, as found in the accumulator is noted, the accumulator cleared, following which the sum is set up on the multiplier keys (not shown) so as to multiply the interest factor set up in the keyboard by this sum of the balances entered in the machine. The product thus found represents the total interest. Upon completion of the calculations relevant to one account, the accumulator is cleared and the balances of the next account are entered into the machine as before, while, if the interest factor remains the same (as is usually the case) for such new account, the setting of this factor in the keyboard need not be disturbed.

We claim:

1. In a calculating machine, the combination with a keyboard having a row of depressible keys, means for holding a depressed one of said keys in depressed position, and releasing means for moving said holding means to release said depressed key; of a blocking device effective to block movement of said holding means by said releasing means, means settable by any of a plurality of said keys upon depression thereof for maintaining said blocking device in blocking position, and manipulable means selectively settable to maintain said blocking device out of blocking position or to cause said device to move to the blocking position in which it may be maintained by said key set means.

2. In a calculating machine, the combination with a keyboard having a row of depressible keys, means for holding a depressed one of said keys in depressed position, and releasing means for moving said holding means to release said depressed key; of a device movable from a first position, through an intermediate second position, to a third position, said device, when in said intermediate second position, rendering said releasing means ineffective to move said holding means, means comprising a manipulable member selectively adjustable to maintain said device in said first position or to move said device to said second and third positions, and means controlled by a depressed key for preventing movement of said device beyond said intermediate second position by said last named means.

3. In a calculating machine, the combination with a keyboard having a row of depressible keys, means for holding a depressed one of said keys in depressed position, and releasing means for moving said holding means to release said depressed

key; of a blocking device movable from a first position, through an intermediate second position, to a third position, said device being effective when in said intermediate second position to block movement of said holding means by said releasing means, means comprising a manipulable member selectively adjustable to maintain said blocking device in said first position or to move said device to said second and third positions, and means controlled by a depressed key for preventing movement of said blocking device beyond said intermediate second position by said last named means.

4. In a calculating machine, the combination with a keyboard having a row of depressible keys, means for holding a depressed one of said keys in depressed position, and releasing means for moving said holding means to release said depressed key; of a device movable from a first position, through an intermediate second position, to a third position, said device, when in said intermediate second position, rendering said releasing means ineffective to move said holding means, means comprising a manipulable member for selectively moving said device to and maintaining said device in said first position or for causing movement thereof toward said third position, means controlled by said keys for preventing movement of said device in one direction past said intermediate position; said preventing means being ineffective to prevent movement of said device from said third to said first position.

5. In a calculating machine, the combination with a keyboard having a row of depressible keys, means for holding a depressed one of said keys in depressed position, and releasing means for moving said holding means to release said depressed key; of a blocking device movable from a first position, through an intermediate second position, to a third position, said device being effective, when in said intermediate second position, to block movement of said holding means by said releasing means, means comprising a manipulable member for selectively moving said blocking device to and maintaining said blocking device in said first position or for causing movement thereof toward said third position, means controlled by said keys for preventing movement of said blocking device in one direction past said intermediate position; said preventing means being ineffective to prevent movement of said device from said third to said first position.

6. In a calculating machine, the combination with a keyboard comprising a row of depressible keys; a control member movable from an ineffective position to an effective position by any of said keys, and means for holding said member in said effective position; of releasing means for causing said last mentioned means to release said member from said holding means, a device movable from a first position, through an intermediate second position, to a third position, said device, when in said intermediate position rendering said releasing means ineffective to move said holding means, means comprising a manipulable member selectively adjustable to maintain said device in said first position or to move the same toward said third position, and means comprising said control member for preventing movement of said device beyond said intermediate position when said control member is in said effective position.

7. In a calculating machine, the combination with a keyboard comprising a row of depressible keys; a control member movable from an ineffective position to an effective position by any of

said keys, and means for holding said member in said effective position; of releasing means for causing said last mentioned means to release said member from said holding means, a blocking device movable from a first position, through an intermediate second position, to a third position, said device being effective when in said intermediate position to block movement of said holding means by said releasing means, means comprising a manipulable member selectively adjustable to maintain said blocking device in said first position or to move the same toward said third position, and means comprising said control member for preventing movement of said blocking device beyond said intermediate position when said control member is in said effective position.

8. In a calculating machine, the combination with a keyboard comprising a row of depressible keys; a control member differentially movable from an ineffective position to an effective position by any of said keys, and means for holding said member in said effective position; of releasing means for causing said last mentioned means to release said member from said effective position, a blocking device movable from a first position, through an intermediate second position, to a third position, said device being effective when in said intermediate position to block movement of said holding means by said releasing means, means comprising a manipulable member for maintaining said blocking device in said first position or to move the same toward said third position, means comprising said control member for preventing movement of said blocking device in one direction beyond said intermediate position when said control member is in said effective position; said means being ineffective to prevent movement of said blocking device from said third position to said first position.

9. In a calculating machine, the combination with a keyboard having a row of depressible keys, means for holding a depressed one of said keys in depressed position, and releasing means for moving said holding means to release said depressed keys; of a blocking device movable from a first position, through an intermediate second position, to a third position, said device being effective when in said intermediate position to block movement of said holding means by said releasing means, means comprising a selectively settable member for maintaining said blocking device in said first position or said intermediate position or permitting movement of said blocking device toward said third position, and means controlled by said keys for preventing movement of said blocking device beyond said intermediate second position.

10. In a calculating machine, the combination with a keyboard having a row of depressible keys, means for holding a depressed one of said keys in depressed position, and releasing means for moving said holding means to release said depressed key; of a blocking device movable from a first position, through an intermediate second position, to a third position, said device being effective when in said intermediate second position to block movement of said holding means by said releasing means, spring means for moving said blocking device toward said third position, selectively settable means for holding said blocking device in said first position or said intermediate second position, or for releasing said

device for movement toward said third position by said spring means, and means controlled by said keys for preventing movement of said blocking device beyond said intermediate second position.

11. In a calculating machine, the combination with a keyboard comprising a plurality of rows of depressible keys, and means individual to each of said rows for holding depressed keys thereof in depressed position; of common releasing means capable of moving all of said holding means to release the depressed keys therefrom, selectively settable means, and means comprising members individual to said rows of keys and jointly controlled collectively by said settable means and individually by the corresponding rows of keys, upon setting of said settable means after depression of said keys, for restraining movement of the holding means by said releasing means in those rows in which said depressed keys are situated, said jointly controlled means being ineffective, upon setting of said settable means after depression of said keys, to restrain movement of the holding means by said releasing means in the remaining rows.

12. In a calculating machine, the combination with a keyboard having a plurality of rows of depressible keys and means individual to each of said rows for holding depressed keys thereof in depressed position; of releasing means for moving said holding means to release the depressed keys, a control device selectively settable to either of two different positions, means controlled by said device when moved to one position for rendering said holding means irresponsive to movement of said releasing means, and means controlled by depressed keys, when said device is moved to a second position after depression of said depressed keys, for causing certain of said device-controlled means to render said holding means in those rows in which said depressed keys are situated irresponsive to movement of said releasing means.

13. In a calculating machine, the combination with a keyboard having a plurality of rows of depressible keys and means individual to each of said rows for holding depressed keys thereof in depressed position; of releasing means for moving said holding means to release the depressed keys, a control device selectively settable to any of three different positions, means controlled by said device when moved to one position for rendering said holding means irresponsive to movement of said releasing means, and when moved to a second position for rendering said holding means responsive to movement of said releasing means; and means controlled by depressed keys, when said device is moved to a third position after depression of said keys, for causing certain of said device controlled means to render the holding means, in those rows in which said depressed keys are situated, irresponsive to movement of said releasing means and to render the holding means in the remaining rows responsive to movement of said releasing means.

14. In a calculating machine, the combination with an automatic calculation controlling mechanism including a settable operation initiating device therefor, and a keyboard comprising a row of depressible keys, and means for holding a depressed one of said keys in depressed position; of releasing means for moving said holding means to release said depressed keys, a blocking device movable from a first position to another position, said device being effective when in said

other position to render said holding means irresponsive to movement by said releasing means, means comprising a selectively settable device, and control means operable thereby for selectively maintaining said blocking device in either of said positions; and means controlled by said operation initiating device for rendering said control means irresponsive to operation by said selectively settable device and for operating said control means to maintain said blocking means in said other position.

15. In a calculating machine, the combination with an automatic calculation controlling mechanism including a settable operation initiating device therefor, and a keyboard comprising a row of depressible keys and means for holding a depressed one of said keys in depressed position; of releasing means for moving said holding means to release said depressed keys, a blocking device movable from a first position, through an intermediate second position, to a third position, said device being effective, when in said intermediate position, to render said holding means irresponsive to movement of said releasing means, means comprising a selectively settable device and control means actuated thereby for selectively causing movement of said blocking device toward any of said positions; and means controlled by said initiating device for rendering said control means irresponsive to operation by said selectively settable device and for operating said control means to maintain said blocking device in said intermediate position.

16. In a calculating machine, the combination with an automatic calculation controlling mechanism including a settable operation initiating device therefor, and a keyboard having a plurality of rows of depressible keys and means individual to each of said rows for holding depressed keys thereof in depressed position; of releasing means for moving said holding means to release said depressed keys, means comprising a selectively settable member and a control device movable thereby into any of three different positions; means controlled by said device when moved into one of said positions for rendering said holding means irresponsive to movement of said releasing means and when moved into a second one of said positions for rendering said holding means responsive to movement of said releasing means, means controlled by depressed keys, when said device is moved to the third one of said positions after depression of said depressed keys for causing certain of said device-controlled means to render said holding means irresponsive to movement by said releasing means in those rows in which said depressed keys are situated, and means controlled by said initiating device upon setting thereof for rendering said control device irresponsive to operation by said settable member and for moving said control device into said first mentioned position.

17. In a calculating machine, the combination with an automatic calculation controlling mechanism including a settable operation initiating device therefor, and a keyboard having a plurality of rows of depressible keys and means individual to each of said rows for holding depressed keys thereof in depressed position; of releasing means for moving said holding means to release said depressed keys, means comprising a selectively settable member and a control device movable thereby into either of two different positions; means controlled by said device when moved into one of said positions for rendering said holding

means irresponsive to movement by said releasing means, means controlled by depressed keys, when said device is moved to the other of said positions after depression of said depressed keys, for causing certain of said device controlled means to render said holding means irresponsive to movement by said releasing means in those rows in which said depressed keys are situated, and means controlled by said initiating device upon setting thereof for rendering said control device irresponsive to operation by said settable member and for moving said control device into said first mentioned position.

18. In a calculating machine having a keyboard comprising a row of depressible keys, means for holding a depressed one of said keys in depressed position, and releasing means for moving said holding means to release said depressed key; control means selectively settable to a plurality of positions, and means placed under control of said depressed key by said control means, upon setting of said control means to one of said positions after depression of said keys, for rendering said releasing means ineffective to move said holding means.

19. In a calculating machine having a keyboard comprising a row of depressible keys, means for holding a depressed one of said keys in depressed position, and releasing means for moving said holding means to release said depressed key; control means selectively settable to a plurality of positions, and means placed under control of said depressed key by said control means, upon setting of said control means to one of said positions after depression of said key, for preventing movement of said holding means by said releasing means.

20. In a calculating machine, the combination

with a keyboard comprising a plurality of rows of depressible keys, and restraining means individual to each of said rows for holding depressed keys thereof in depressed position; of common releasing means capable of moving all of said restraining means to release the depressed keys, selectively settable means, and means comprising members individual to said rows of keys and jointly controlled collectively by said settable means upon setting thereof and individually by the corresponding row of keys for rendering the releasing means ineffective to move said restraining means in those rows in which said depressed keys are situated.

21. In a calculating machine, the combination with a keyboard comprising a plurality of rows of depressible keys, key restraining means individual to each of said rows and effective in one position thereof to hold a depressed one of said keys in depressed position, and effective in a second key releasing position thereof to release said depressed key; of key releasing means including a member common to all of said rows of keys and means for moving said member from a normal to an active position, said restraining means being normally responsive to movement of said member to active position so as to be moved thereby to said key releasing position, selectively settable means, and means controlled jointly by the settable means upon setting thereof and by a depressed one of said keys for rendering the restraining means in that row in which said depressed key is situated irresponsive to movement of said member to said active position.

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