

Dec. 2, 1941.

W. H. PETIT

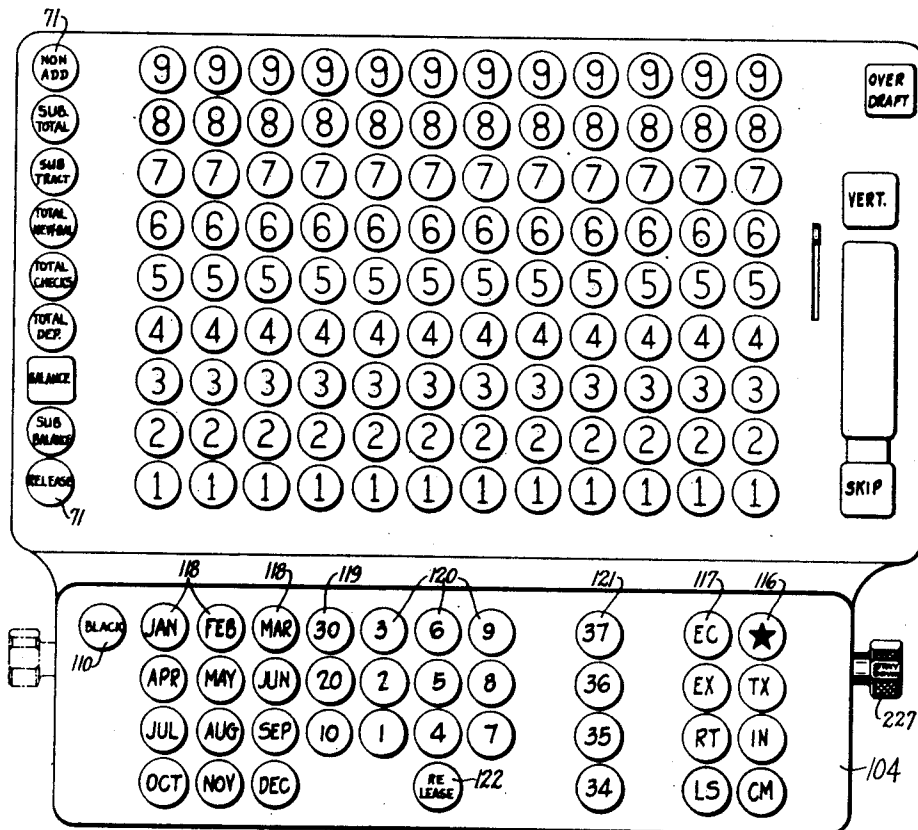
2,264,582

ACCOUNTING MACHINE

Original Filed Aug. 24, 1936

6 Sheets-Sheet 1

FIG. 1



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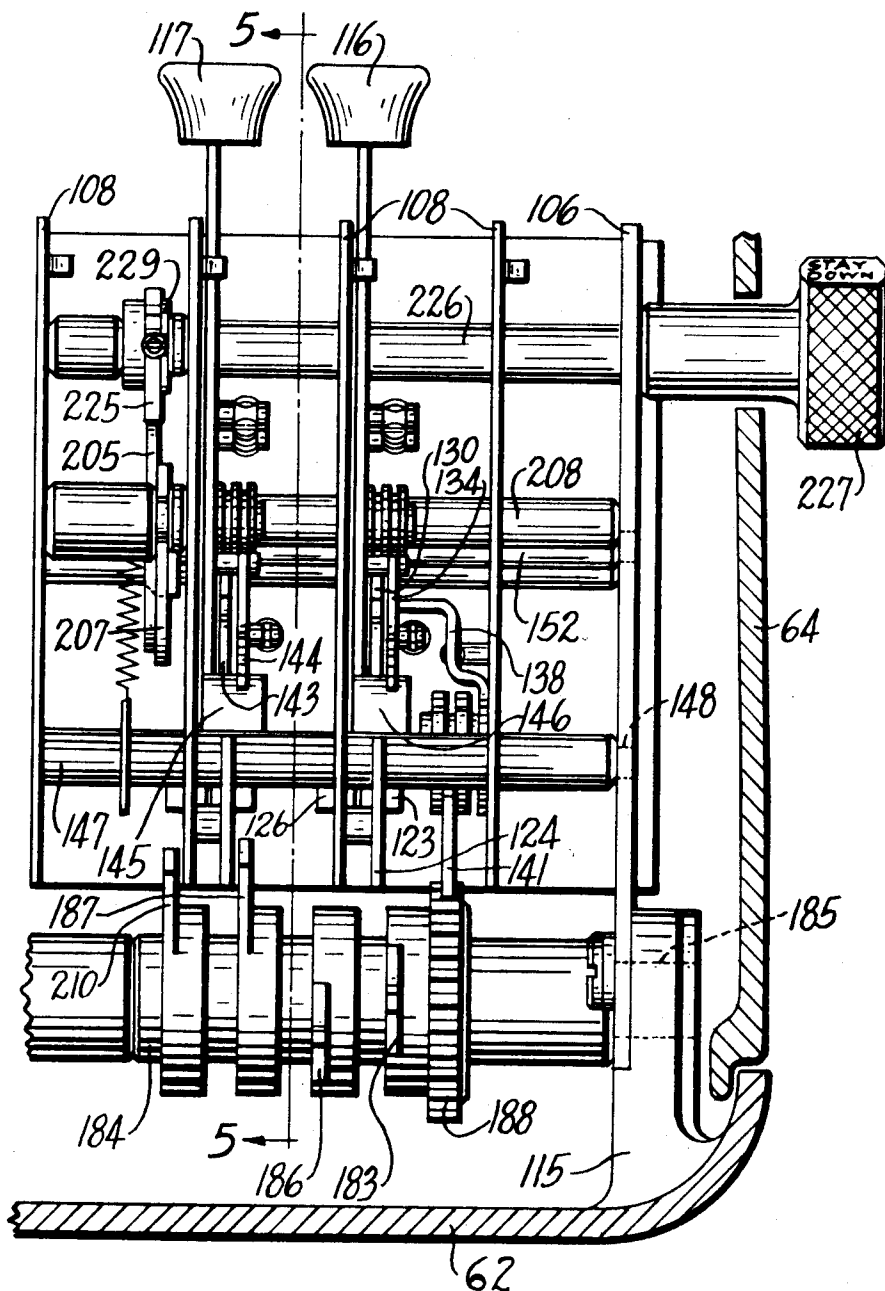
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6 Sheets-Sheet 2

Fig. 2



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ACCOUNTING MACHINE

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6 Sheets-Sheet 3

Fig. 3

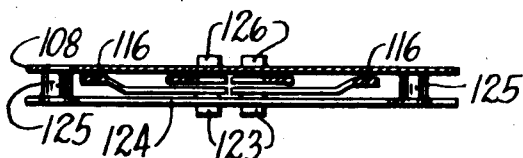


Fig. 4

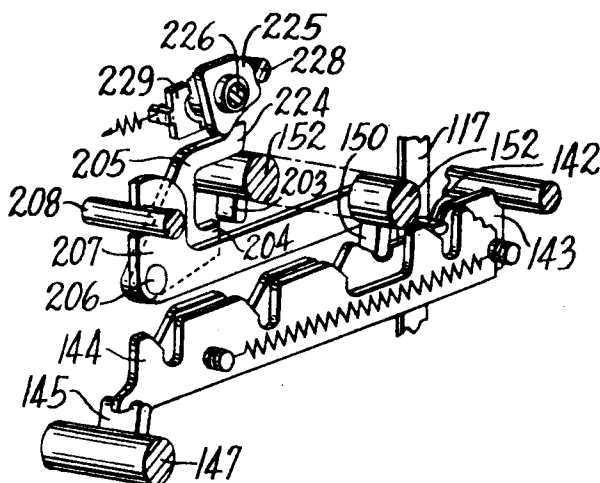
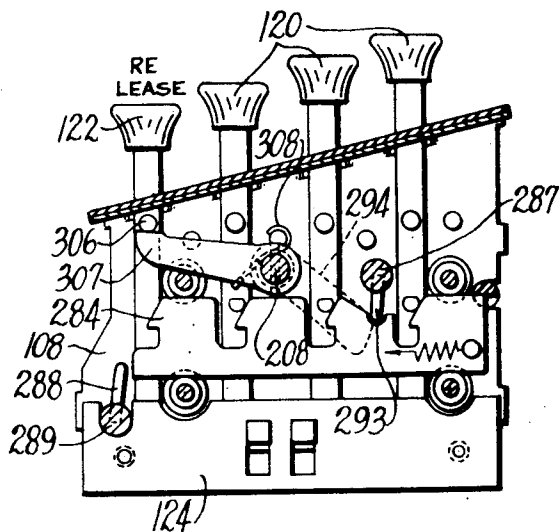


Fig. 7



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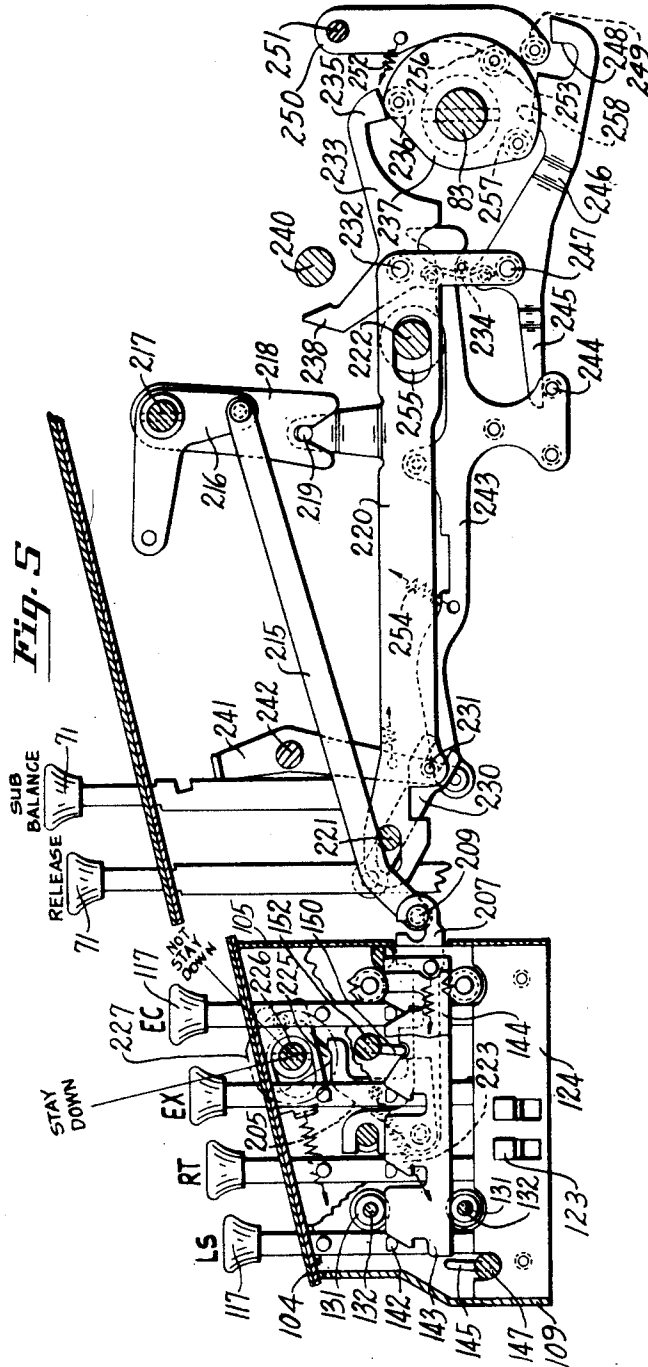
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ACCOUNTING MACHINE

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6 Sheets-Sheet 4



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ACCOUNTING MACHINE

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6 Sheets-Sheet 5

Fig. 9

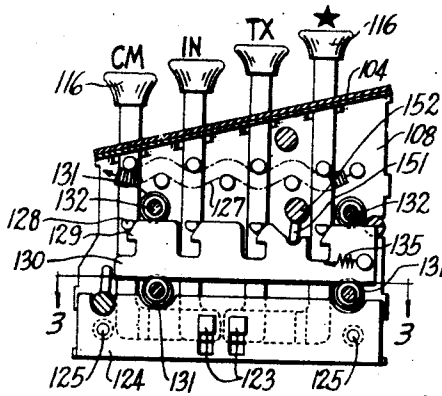


Fig. 6

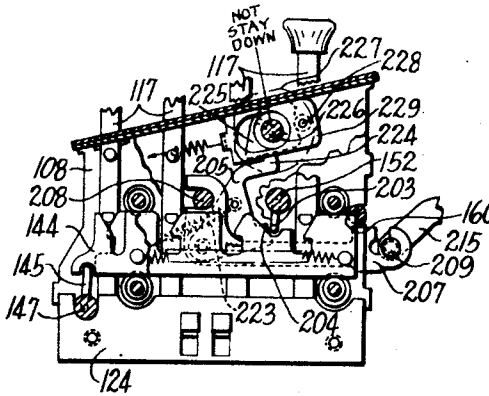
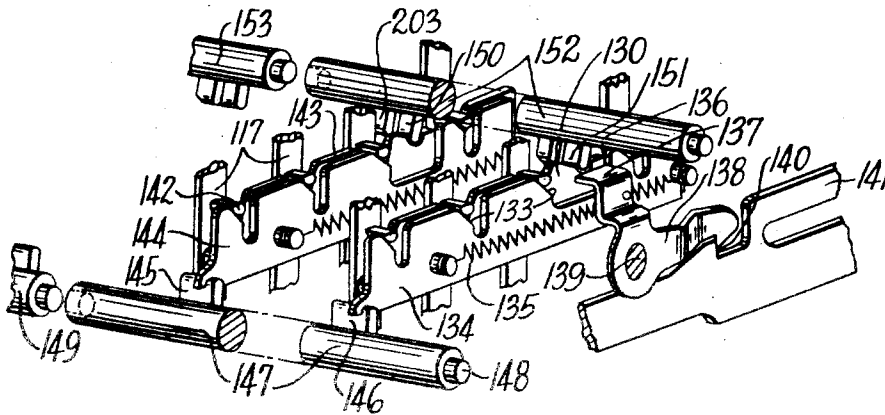


Fig. 8



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ACCOUNTING MACHINE

Original Filed Aug. 24, 1936 6 Sheets-Sheet 6

Fig. 10

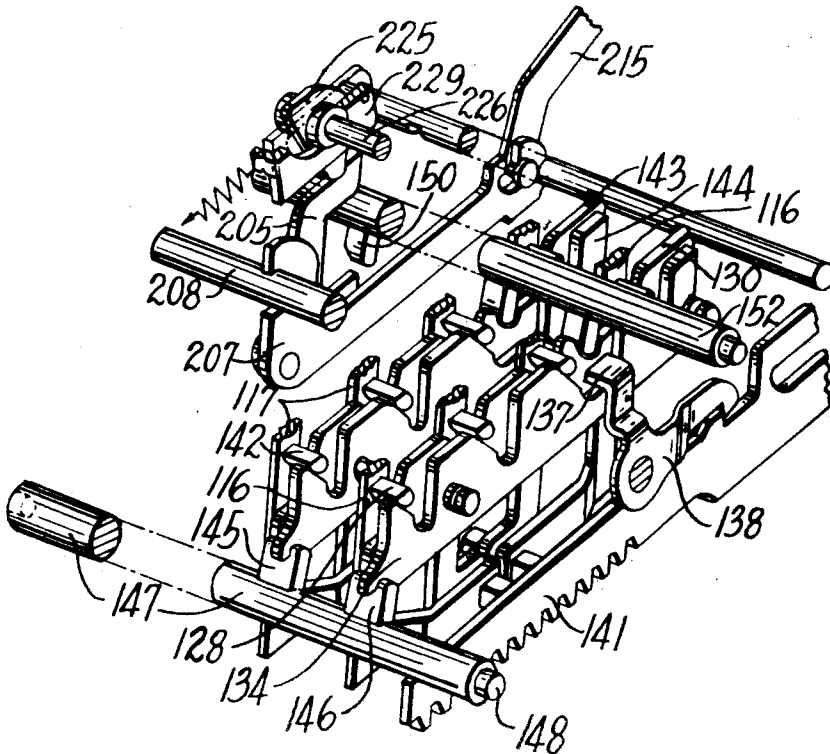
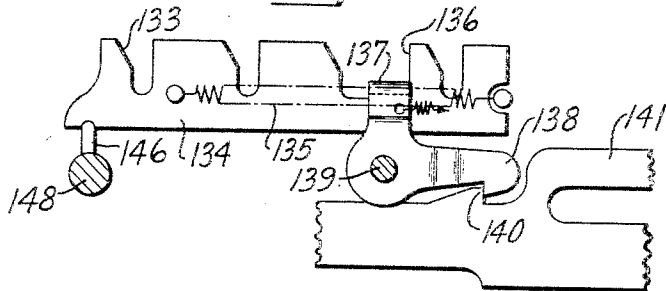


Fig. 11



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UNITED STATES PATENT OFFICE

2,264,582

ACCOUNTING MACHINE

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Original application August 24, 1936, Serial No.
97,564. Divided and this application June 30,
1938, Serial No. 216,643

3 Claims. (Cl. 235-145)

This invention relates to bookkeeping or accounting machines and the like and is particularly directed to machines of the type illustrated and described in Letters Patent of the United States No. 1,197,278 and No. 1,203,863, issued respectively September 5, 1916, and November 7, 1916, to Halcolm Ellis, and Patent No. 1,819,084, issued August 18, 1931, to Emil John Ens. This application is a division of applicant's copending application, Serial No. 97,564, which was filed on August 24, 1936.

An object of this invention is to supply means to automatically release the keys of the auxiliary keyboard.

A further object is to provide manual means for releasing the keys of the auxiliary keyboard.

A still further object is the provision of means for locking the keys of the auxiliary keyboard against release or depression during machine operation.

Another object is to provide means for controlling the manual and automatic release of certain keys.

Another object is to provide novel means to coordinate the operation of the retaining means for the keys of several rows of keys forming a single group of keys.

Another object is to provide manually operable means to control the operation of key retaining means by key releasing means to enable the keys to be automatically released or retained in their set positions as desired.

With these and incidental objects in view, the invention includes certain novel features of construction and combinations of parts, the essential elements of which are set forth in appended claims and a preferred form or embodiment of which is hereinafter described with reference to the drawings which accompany and form a part of this specification.

In the drawings:

Fig. 1 is a diagrammatic top plan view of the main and auxiliary keyboards of the machine embodying the invention.

Fig. 2 is an elevation of a part of the auxiliary keyboard, as observed from the front of the machine, with the case broken away.

Fig. 3 is a sectional view taken along the line 3-3 in Fig. 9.

Fig. 4 is a perspective view of the mechanism for controlling the releasing of the symbol keys.

Fig. 5 is a sectional view along line 5-5 Fig. 2 showing the key releasing mechanism for the auxiliary keyboard.

Fig. 6 is a detail view of the release controlling mechanism for the symbol keys.

Fig. 7 is a sectional view showing the mechanism for manually releasing the keys of the auxiliary keyboard.

Fig. 8 is a perspective view of the control plates for one group of keys of the auxiliary keyboard.

Fig. 9 is a sectional view of one of the rows of keys of the auxiliary keyboard.

Fig. 10 is a disassembled perspective view of the auxiliary keyboard mechanism.

Fig. 11 is a detail view of the zero latch and the control bar for operating the zero latch.

GENERAL DESCRIPTION

The principal feature of the present invention resides in the provision of novel locking and releasing means for the keys of an auxiliary keyboard for accounting machines of the type referred to at the beginning of this specification. The auxiliary keyboard is located directly in front of the main keyboard, is supported by an extension of the regular machine base, and is enclosed in a suitable extension of the machine's case or cabinet. In the embodiment shown, the auxiliary keyboard includes month, day, and year keys, a plurality of symbol printing keys, and a "black" key. The "black" key and its associated mechanism will be thoroughly treated in a separate application and therefore will not be treated herein. By removing the date keys and the symbol keys from the main keyboard, space is provided for additional rows of keys, which materially increases the keyboard capacity of the machine. The keys of the auxiliary keyboard are not limited to the uses outlined above but may, with minor alterations, be utilized for any desired purpose, such as, amount, check counting, number printing, etc.

The keys of the auxiliary keyboard are arranged in groups containing from three to twelve keys, each group controlling its respective actuator which in turn positions a printing sector commensurate with the value of the depressed key. The month group consists of three rows of four keys each, the tens of days group consists of a single row of three keys, the units of days group consists of three rows of three keys each, and the year group consists of a single row of four keys. The date keys are stay-down keys in that they are not automatically released at the end of each machine operation but may be manually released by means of a "release" key incorporated in the auxiliary keyboard.

The symbol keys consist of two rows of four keys each, which control the positioning of a symbol actuator. The symbol keys are automatically released at the end of each machine operation and furthermore, may be manually released by means of the regular "release" key incorporated in the main keyboard of the machine. A manually operated device is provided for controlling the automatic and manual release of the symbol keys.

The mechanism of the auxiliary keyboard will now be described in detail.

DETAILED DESCRIPTION

Operating mechanism

The main shaft 83 is driven by the usual driving mechanism illustrated and described in Letters Patent of the United States No. 1,601,102, which issued September 28, 1926, to F. W. Bernau. One cycle of movement of the main shaft consists of an oscillatory movement counter-clockwise (as viewed in Fig. 5) through an approximate angle of 60 degrees and then back to its starting position.

Auxiliary keyboard

The auxiliary keyboard, which contains the novel mechanism of the present invention, is a self-contained unit mounted directly in front of the main keyboard. As previously stated, this auxiliary keyboard includes date printing keys and symbol printing keys. However, the uses to which the keys of the auxiliary keyboard are put is discretionary and this additional keyboard space may, with slight alterations, be used for any desired purpose. The date and the symbol printing keys are arranged in groups composed of one, two, and three rows of keys and each group of keys controls the positioning of its corresponding actuator, which in turn positions the printing sectors for the respective groups of keys in proportion to the amount of movement allowed by the depressed keys.

The symbol keys are automatically released at the end of each machine operation but this releasing may be controlled by means of a manually set device. The symbol keys may be manually released at will by means of the regular "release" key 71 (Fig. 1) which also releases the keys of the main keyboard. The date keys are not automatically released at the end of the machine operation but these keys may be manually released at will by means of a "release" key incorporated in the auxiliary keyboard. Located on the extreme left of the auxiliary keyboard is a "black" key 110 which controls the bichrome inking ribbon in subtract operations. Depressing the "black" key causes subtractive items, which are usually printed in red, to be printed in black. As the "black" key and its associated mechanism are fully described in a separate application, further mention of this key will not be made herein.

Auxiliary keyboard framework

Directing attention to Figs. 1, 2, 5, and 9, the framework of the auxiliary keyboard comprises a top plate 104, a back plate 105, end plates 106 (only one being shown), and a plurality of partition plates 108, equally spaced between the end plates 106, and arranged to assist in supporting the various rows of keys. The auxiliary keyboard framework also includes a front plate 106 which is connected to the end plates 106, as also is the

back plate 105. The end plates 106 are fastened, by screws (Fig. 2), to extending lugs 115 of the machine base 62, thereby rigidly securing the auxiliary keyboard assembly to the machine proper.

Date and symbol keys

The keys of the auxiliary keyboard comprise two rows, of four keys each, of symbol keys 116 and 117 (Figs. 1, 2, and 10), three rows, of four keys each, of month keys 118, one row of three tens of days keys 119, three rows, of three keys each, of units of days keys 120, one row of four year keys 121, and a "release" key 122 for the date keys.

The upper ends of the symbol keys 116 and 117 (Figs. 5 and 9) extend through openings in the top plate 104. The right-angled extensions of the lower end of the "star" symbol key 116 and the "CM" symbol key 116 each carries a square stud 123 which extends through vertical slots in a plate 124 connected to the plate 108 and spaced therefrom by two shoulder studs 125. The lower ends of the stems of the "TX" and "IN" symbol keys have right-angled extensions, each carrying a square stud 126 (Fig. 3) each of which extends through its respective vertical slot in the partition plate 108. The studs 126 are in alignment with the studs 123.

The manner in which the studs 123 and 126 control the positioning of an actuator is not described herein as it forms no part of the instant invention. This control is explained fully in the parent case.

A coil spring 127 (Fig. 9) laced between studs in the stems of the keys 116 and stationary studs in the plate 108 urges said keys upwardly and normally maintains the studs 123 and 126 in contact with the top of the vertical slots in the plates 124 and 108.

Each of the symbol keys 116 carries a stud 128 (Fig. 9) which cooperates with its corresponding angular nose on its respective hook 129 formed in a locking detent 130 mounted for horizontal sliding movement between four rollers 131, loose on studs 132, secured in the plate 108 for this row of keys. The studs 128 also cooperate with angular camming surfaces 133 (Figs. 8 and 11), formed in a control plate 134, also slidably supported by the rollers 131. A spring 135 tensioned between the detent 130 and the plate 134, urges them forwardly and rearwardly respectively to normally maintain the angular noses of the hooks on the detent 130 and the angular camming surfaces 133 of the plate 134, in contact with the studs 128. A wall 136 of a recess in the control plate 134 (Figs. 8 and 11) cooperates with a bent-over extension 137 of a zero latch 138, rotatable on a stationary stud 139 in one of the plates 108. The hook of the latch 138 normally engages a tooth 140 in a symbol actuator 141 to retain said actuator in zero or home position whenever the machine is operated with no symbol key depressed.

Depressing one of the symbol keys 116 (Figs. 8 and 9) causes the stud 128 to shift the detent 130 rearwardly until said stud passes beyond the corresponding hook 129 of said detent, whereupon the spring 135 returns the detent forwardly to latch the hook over a flat top surface of said stud 128 to retain the symbol key in depressed position. Depressing one of the symbol keys 116 also causes the studs 128 in cooperation with the camming surface 133 to shift the control plate 134 forwardly against the action of the spring

135 to rock the latch 138 counter-clockwise out of engagement with the tooth 140 to free the actuator 141 for movement. When no symbol key is depressed, the zero latch 138 remains effective, as here shown, and locks the actuator 141 against movement during machine operation.

The left-hand row of symbol keys 117 (Figs. 1, 5 and 8) each carries a stud 142 which cooperates with a corresponding hook of a locking detent 143 and the angular camming surface of a control plate 144, similar in every respect to the detent 130 and the plate 134 (Figs. 8 and 9) for the right-hand row of symbol keys 116.

The control plates 144 and 134 for the symbol keys each has a notch in the front end thereof which is engaged respectively by the rounded ends of lugs 145 and 146 integral with a shaft 147 having a tenon 148 which fits loosely in a hole in the end plate 106 (Fig. 2). The left-hand end of the shaft 147 has a recess therein which loosely engages a tenon on a shaft 149 for the year keys 121. The shafts 147 and 149 are journaled in holes in the partition plates 108 and similar shafts for the other groups of keys are mounted in alignment with, and in exactly the same manner as, the shafts 147 and 149, as clearly illustrated in Figs. 2 and 10. It is therefore evident that the control plates 144 and 134 are tied together and when one of the keys 117 is depressed, forward movement of the plate 144 rocks the plate 134 in unison therewith to rock the zero latch 138 counter-clockwise out of engagement with the tooth 140 of the actuator 141.

The locking detents 143 and 130 (Figs. 6, 8 and 10) are also tied together by means of notches in said detents in cooperation with lugs 150 and 151 integral with a shaft 152 mounted in exactly the same manner as the shaft 147 by means of a tenon on the right end thereof, in cooperation with a recess in the end plate 106 (Fig. 2) and by means of a recess in the left end thereof in cooperation with a tenon on a release shaft 153 for the year keys 121. The shafts 152 and 153 are further rotatably supported by holes in the partition plates 108. The two locking detents for the two rows of symbol keys are tied together so that releasing movement of the shaft 152 will release the depressed key in either of the two rows, in a manner later to be described. It is probably well to here state that each row of keys of the different groups has a locking detent and a control plate similar to those for the symbol keys, and in the case of the units of days keys 120 (Figs. 1 and 10) and the month keys 118 the control plates and the locking detents are tied together in exactly the same manner as the control plates and locking detents for the two rows of symbol keys 116 and 117.

Release mechanism for the symbol keys

Mechanism is provided to automatically release the depressed symbol key at the end of non-adding, adding, and subtracting operations and at the beginning of total and sub-total operations. Connections between the automatic releasing mechanism and the "release" key 71 (Fig. 5), for the main keyboard, provide manual means for releasing the symbol keys. A manually operated device is provided for controlling both the automatic and manual releasing means for the symbol keys. The date keys are stay-down keys and consequently are never automatically released. However, the "release" key 122 (Fig. 1) provides a manual means for releasing the de-

pressed date keys. The key releasing mechanism will now be described in detail.

The symbol key release shaft 152 (Figs. 4, 5, 6, 8, and 10), in addition to having lugs 150 and 151 for the locking detents 143 and 130, has a similar lug 203 which cooperates with a rearward projection 204 of a control plate 205 pivoted at 206 to a slide 207 mounted for horizontal sliding movement in the auxiliary keyboard framework by means of a slot in an upward extension thereof cooperating with a rod 208 supported by the plates of the auxiliary keyboard, and by means of an opening in the back plate 105 through which the rearward end of said slide 207 extends. The end of the slide 207, which protrudes through the opening in the back plate 105, has a slot which cooperates with a stud 209 in one end of a link 215 (Fig. 5), the other end of which is pivotally connected to one arm of a bell crank 216 secured on a key release shaft 217 for the main keyboard and journaled in the framework of said keyboard. Also secured on the release shaft 217 is a depending arm 218 with an inverted V shaped notch which engages a stud 219 in an upward extension of a key release bar 220 mounted for horizontal sliding movement by means of two horizontal slots therein, in cooperation with studs 221 and 222 fast in the usual left machine frame (not shown). The manner in which the bar 220 operates the slide 207 to release the depressed symbol keys will be explained later.

A spring 223 (Figs. 5 and 6) urges the control plate 205 counter-clockwise to normally maintain an extension 224 thereof in contact with the periphery of a cam 225 (see also Fig. 2) secured on a shaft 226 journaled in the end plate 106 and several of the partition plates 108. Secured on the right-hand end of the shaft 226 and protruding through an opening in the case 64 is a knob 227 for manually rotating the cam 225. The knob 227 and the cam 225 have two positions, "stay-down" and "not-stay-down," and when said knob and said cam are in "stay-down" position, as shown in Figs. 4 and 5, the high portion of the periphery of the cam 225 positions the control plate 205 so that the projection 204 thereof is out of the path of the lug 203 on the shaft 152. Consequently when the slide 207 is reciprocated, first rearwardly and then back to normal position, either manually or automatically, in a manner presently to be described, no movement is imparted to the shaft 152 and therefore the depressed symbol key will not be released.

Turning the knob 227 to "not-stay-down" position, as shown in Fig. 6, moves a low portion of the periphery of the cam 225 opposite the extension 224 (see also Figs. 4, 8, and 10) to permit the spring 223 to rock the control plate 205 counter-clockwise to move the projection 204 thereof upwardly into the path of the lug 203. This causes the reciprocating movement of the slide 207 to rock the shaft 152, and the lugs 150 and 151 first counter-clockwise to shift the locking detents 143 and 130 rearwardly to disengage the corresponding hook 129 of either of said detents from the studs 142 or 128 in the depressed symbol key 117 or 116 to permit said key to be spring-returned upwardly to undepressed position. Two notches in the periphery of the cam 225 (Figs. 2, 4, and 6) correspond to the "stay-down" and the "not-stay-down" positions of said cam, and in cooperation with a stud 228 in a spring-pulled slide 229 maintain the cam 225, the shaft 226, and knob 227 in set positions. The slide 229 is

slidably mounted on the shaft 226 by a slot therein in cooperation with said shaft.

The release key 71 (Fig. 5) has pivotally connected thereto one end of a toggle link 230, the other end of which is bifurcated to straddle a stud 231 in the bar 220. Depressing the release key 71, by means of the link 230, shifts the bar 220 rearwardly, which by means of the stud 219, in cooperation with the arm 218, rocks the shaft 217 and the bell crank 216 counter-clockwise. Counter-clockwise movement of the bell crank 216, by means of the link 215, shifts the slide 207 rearwardly to release the depressed symbol key in the manner explained above.

Pivoted on a stud 232 in the bar 220 is a key release pawl 233 urged clockwise by a torsion spring 234 to normally maintain the bottom surface of a hook 235 thereon in contact with a roller 236 mounted on a disk 237 secured on the main drive shaft 83. It will be recalled that the main shaft 83 is oscillated first counter-clockwise and back to normal position. In non-adding, adding, and subtracting operations initial movement counter-clockwise of the main shaft 83 and the disk 237 causes the roller 236 to move beyond the hook 235, whereupon the torsion spring 234 urges the pawl 233 clockwise to latch said hook 235 over said roller 236. Return movement clockwise of the shaft 83 and the disk 237 causes the roller 236 to engage the hook 235 to shift the bar 220 rearwardly to rock the shaft 217 counter-clockwise, which by means of the bell crank 216 and the link 215 shifts the slide 207 rearwardly to rock the symbol key release shaft 152 counter-clockwise, when the knob 227 (Fig. 2) is in "not-stay-down" position, to release the depressed symbol key. Before the disk 237 and the roller 236 are fully returned clockwise to normal position an upward extension 238 of the pawl 233 engages a stationary stud 240 to disengage the hook 235 from the roller 236 to permit return of the bar 220 and connected mechanism to normal position under influence of the springs 135 (Fig. 10) tensioned between the locking detents and the control plates.

In the beginning of total and sub-total operations it is necessary to shift the bar 220 rearwardly in order to release any amount keys that have been inadvertently or carelessly depressed. This shifting of the bar 220 likewise releases any depressed symbol key when the knob 227 is in "not-stay-down" position.

A latch 241 (Fig. 5), for the "sub-balance" key 71, is pivoted as usual on a stud 242 in the left frame not shown, and has pivotally connected to the lower end thereof a lever 243 carrying a stud 244 which cooperates with a tail 245 of a key release pawl 246 fulcrumed at 247 to a downward extension of the bar 220. The pawl 246 has a notch 248 adapted to engage a roller 249 on a lever 250 pivoted on a stationary stud 251 in the left frame not shown. A spring 252 urges the lever 250 clockwise to normally maintain a camming surface of said lever in contact with a roller 253 mounted on the disk 237. The torsion spring 234 urges the pawl 246 counter-clockwise into engagement with the roller 249. However, a spring 254, one end of which is connected to the lever 243, is strong enough to overcome the action of the spring 234 and maintain the pawl 246 disengaged from the roller 249 and to normally maintain the lever 243 in contact with a collar 255 on the stud 222.

Selecting any one of the totalizers for a total or sub-total operation rocks the lever 243 clock-

wise, in the manner shown in the patents referred to at the beginning of this specification (Fig. 5), to permit the spring 234 to engage the notch 248 in the pawl 246 with the roller 249. Initial movement counter-clockwise of the shaft 83 and the disk 237 causes the roller 253 to engage a hump 256 on the camming surface of the lever 250 to rock said lever counter-clockwise to shift the pawl 246 and the bar 220 rearwardly to release any depressed amount or symbol keys at the beginning of machine operation. After the keys have been released, the pawl 246 is disengaged from the roller 249 by a roller 257, carried by the disk 237, engaging a raised portion 258 of said pawl 246 and rocking said pawl clockwise. This permits the bar 220 and associated mechanism to be immediately spring-returned forwardly to normal position, as here shown. Before the roller 257 moves away from the raised surface 258, upon return movement clockwise of the disk 237, the lever 243 is released to the action of the spring 254, which returns said lever counter-clockwise to normal position, as here shown, in which position the stud 244 in cooperation with the tail 245 retains the notch 248 out of engagement with the roller 249 when the roller 257 moves beyond the raised surface 258.

Date keys

As previously stated, the date keys are not automatically released at the end of machine operations, but manual means is provided for releasing these keys when desired.

Each of the three rows of units of days keys 120 (Figs. 1 and 7) has a locking detent 284 and a control plate, not shown, but similar to the control plate 144, and said locking detents are tied together by means of lugs 293 on a shaft 287, and said control plates 285 are tied together by means of notches in the forward ends thereof, in cooperation with the rounded ends of lugs 288 integral with a shaft 289. The shaft 287 carries a lug 293 (Fig. 7) which cooperates with the rounded end of an arm 294 fast on the shaft 208.

By referring to Fig. 1 it will be seen that the "release" key 122 is in alignment with one of the rows of the units of days keys 120, and is depressibly mounted in the auxiliary keyboard framework in exactly the same manner as the "CM" symbol key 116 (Fig. 11), which has been fully explained hereinbefore. Depressing the "release" key 122 (Fig. 7) causes a stud 306 therein, in cooperation with the forward end of an arm 307 secured on the shaft 208, to rock said arm and said shaft counter-clockwise against the action of a torsion spring 308. Counter-clockwise movement of the shaft 208 causes the arm 294, secured thereon, in cooperation with lug 293, to rock the shaft 287 counter-clockwise to shift the locking detents for the different groups of date keys rearwardly to release the depressed date keys.

When the pressure is removed from the "release" key 122, the spring 308 returns the shaft 208 and the arms mounted thereon to normal position and the springs tensioned between the locking detents and the control plates for the date keys restore said detents and plates to normal position.

Similar connections are provided for each set of date keys; i. e., for the month keys 118, the tens of days keys 119, and the year keys 121, all of which are released by connections to shaft 287, so that the rocking of shaft 287 by key 172 releases all the date keys.

While the form of mechanism herein shown and described is admirably adapted to fulfill the objects primarily stated, it is to be understood that it is not intended to confine the invention to the one form or embodiment herein disclosed, for it is susceptible of embodiment in various forms all coming within the scope of the claims which follow.

What is claimed is:

1. In a machine of the class described, in combination with depressible keys and a detent to maintain the keys depressed, said detent thereafter movable to release the depressed keys and said detent provided with a notch, of a rockable shaft; a projection on the shaft engaging the notch in the detent to move the detent when the shaft is rocked; a second projection on the rockable shaft; a power-operated slide mounted separately from said shaft and operable during each operation of the machine; an interponent carried by the power-operated slide; and a spring connected to the interponent to urge the interponent into the path of the second projection on the shaft so that the power-operated slide, through the interponent, rocks the shaft to move the detent to release the depressed keys when the interponent is in the path of the second projection.

2. In a machine of the class described, in combination with depressible keys and a detent to maintain the keys depressed, said detent thereafter movable to release the depressed keys and said detent provided with a notch, of a rockable shaft; a projection on the shaft engaging the notch in the detent to move the detent when the shaft is rocked; a second projection on the rockable shaft; a power-operated slide mounted separately from said shaft and operable during each operation of the machine; an interponent carried by the power-operated slide; a spring connected to the interponent to urge the interponent into the path of the second projection on

the shaft so that the power-operated slide, through the interponent, rocks the shaft to move the detent to release the depressed keys when the interponent is in the path of the second projection; and a control means coacting with the interponent, settable to one position to maintain the interponent out of the path of said second projection to prevent release of the depressible keys and settable into another position to permit the spring to shift the interponent into the path of the second projection to cause the depressed keys to be released during the machine operation.

3. In a machine of the class described, in combination with depressible keys and a detent to maintain the keys depressed, said detent thereafter movable to release the depressed keys and said detent provided with a notch, of a rockable shaft; a projection on the shaft engaging the notch in the detent to move the detent when the shaft is rocked; a second projection on the rockable shaft; a power-operated slide mounted separately from said shaft and operable during each operation of the machine; an interponent carried by the power-operated slide; a spring connected to the interponent to urge the interponent into the path of the second projection on the shaft so that the power-operated slide, through the interponent, rocks the shaft to move the detent to release the depressed keys when the interponent is in the path of the second projection; a control means coacting with the interponent, settable to one position to maintain the interponent out of the path of said second projection to prevent release of the depressible keys and settable into another position to permit the spring to shift the interponent into the path of the second projection to cause the depressed keys to be released during the machine operation; and a manipulative device to selectively position the control means.

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