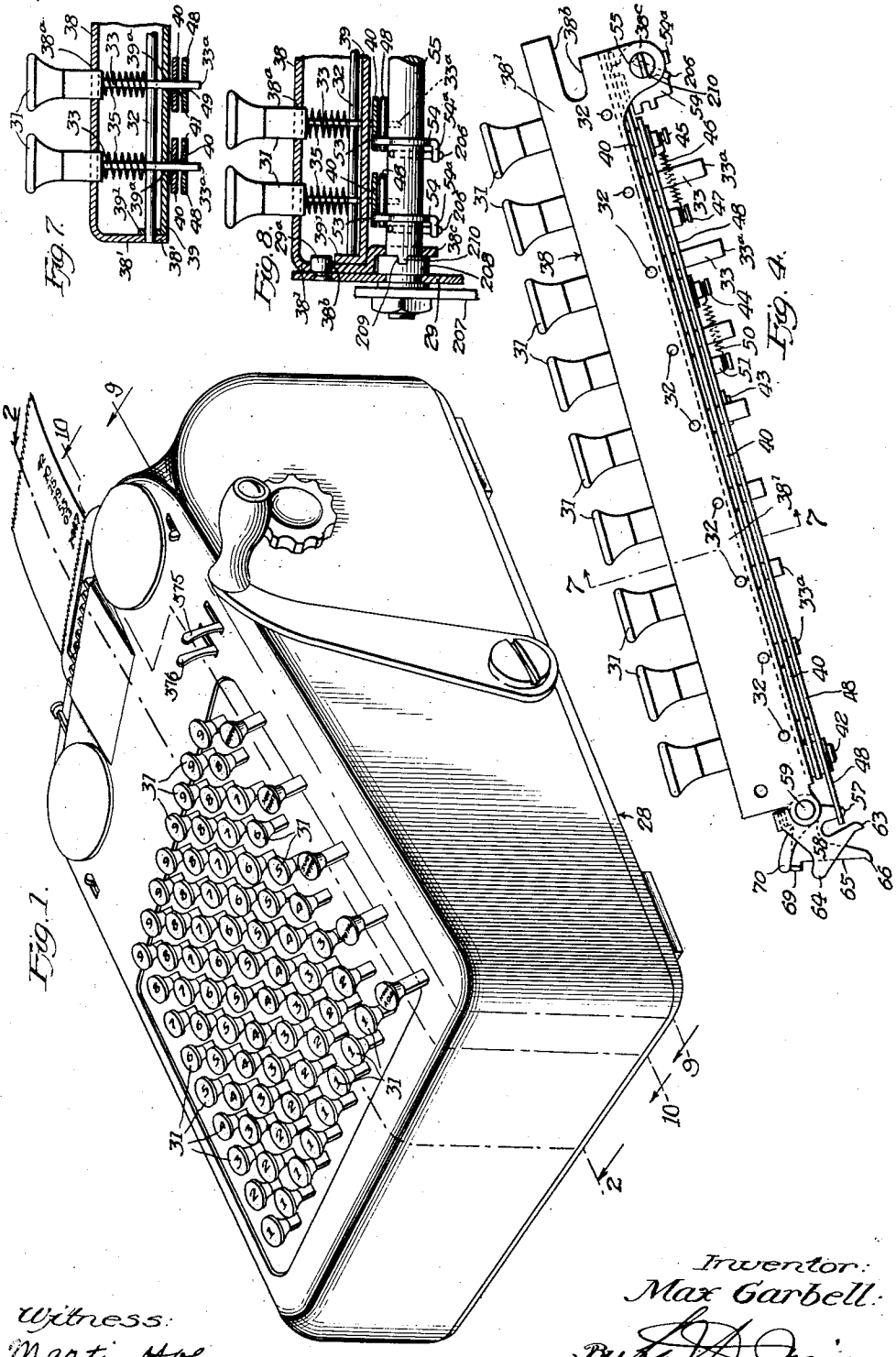
Aug. 31, 1937. M. GARBELL 2,091,778

KEYBOARD CONSTRUCTION AND KEY CONTROL

Original Filed March 24, 1934 8 Sheets-Sheet 1



Witness:
Martin H. Olsen.

Inventor:
Max Garbell.
By Hugh Dalmas Atty

Aug. 31, 1937. M. GARBELL 2,091,778

KEYBOARD CONSTRUCTION AND KEY CONTROL

Original Filed March 24, 1934 8 Sheets-Sheet 2

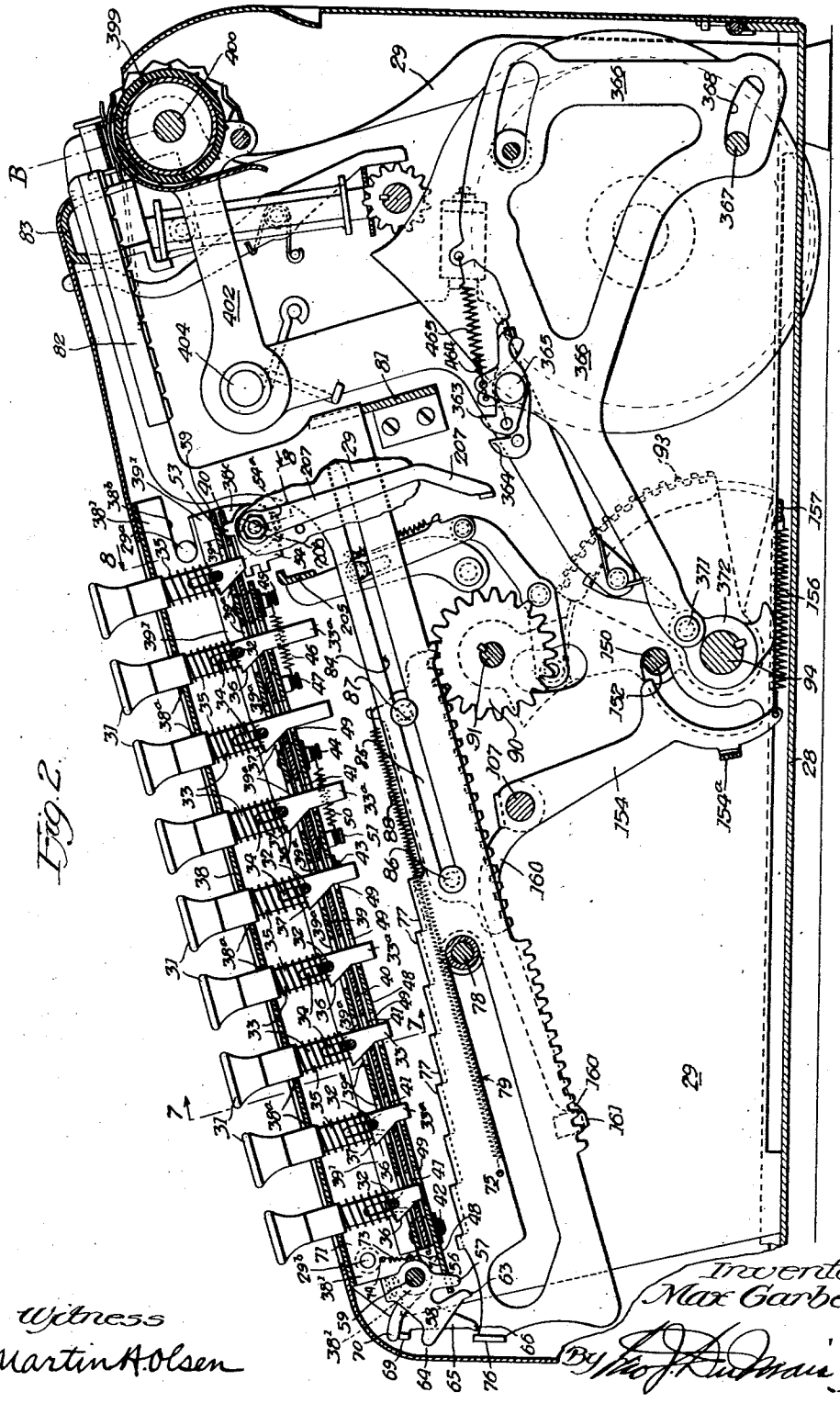


Fig. 2.

Witness
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Aug. 31, 1937. M. GARBELL 2,091,778

KEYBOARD CONSTRUCTION AND KEY CONTROL

Original Filed March 24, 1934 8 Sheets-Sheet 3

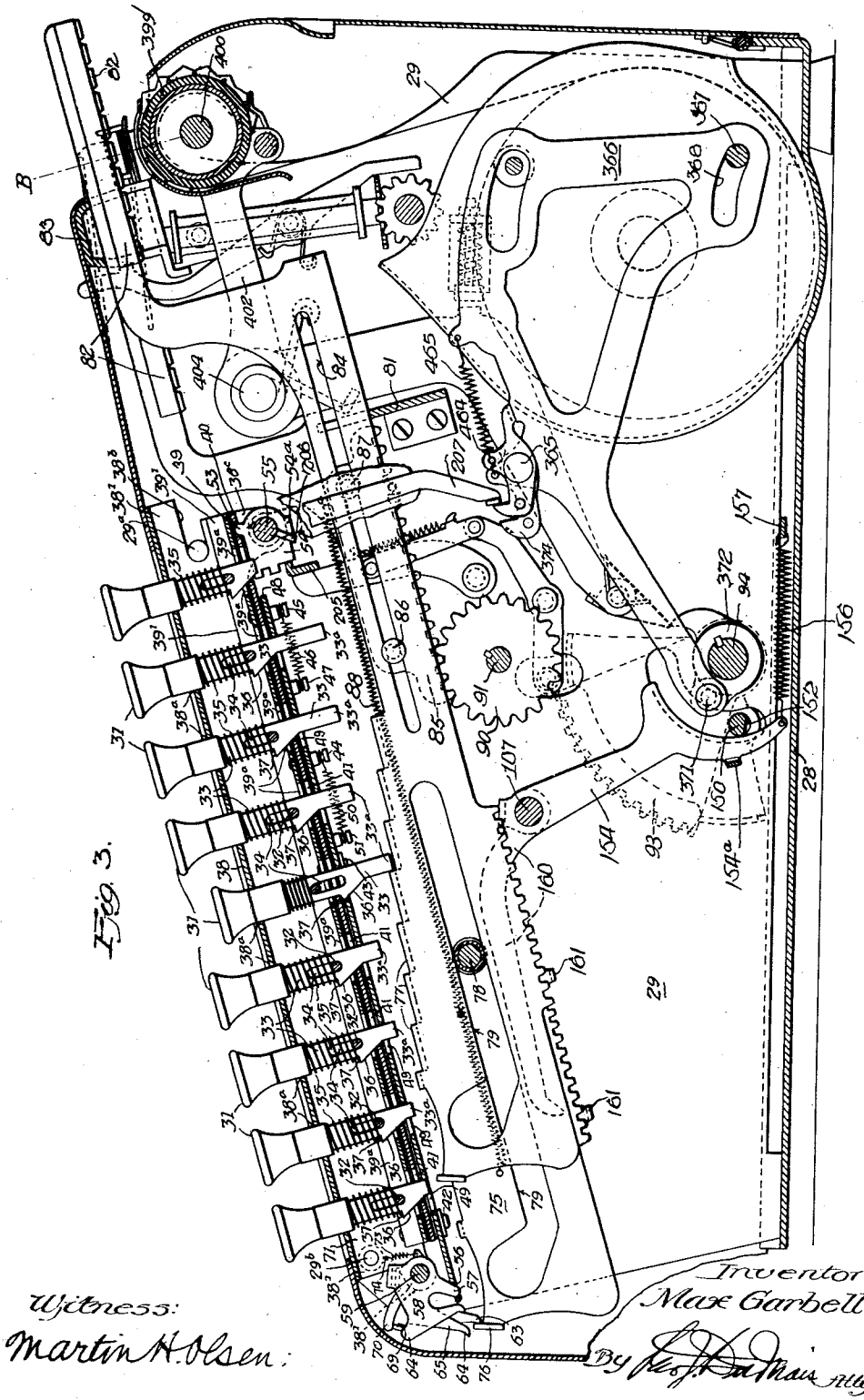


Fig. 3.

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Aug. 31, 1937. M. GARBELL 2,091,778

KEYBOARD CONSTRUCTION AND KEY CONTROL

Original Filed March 24, 1934 8 Sheets-Sheet 4

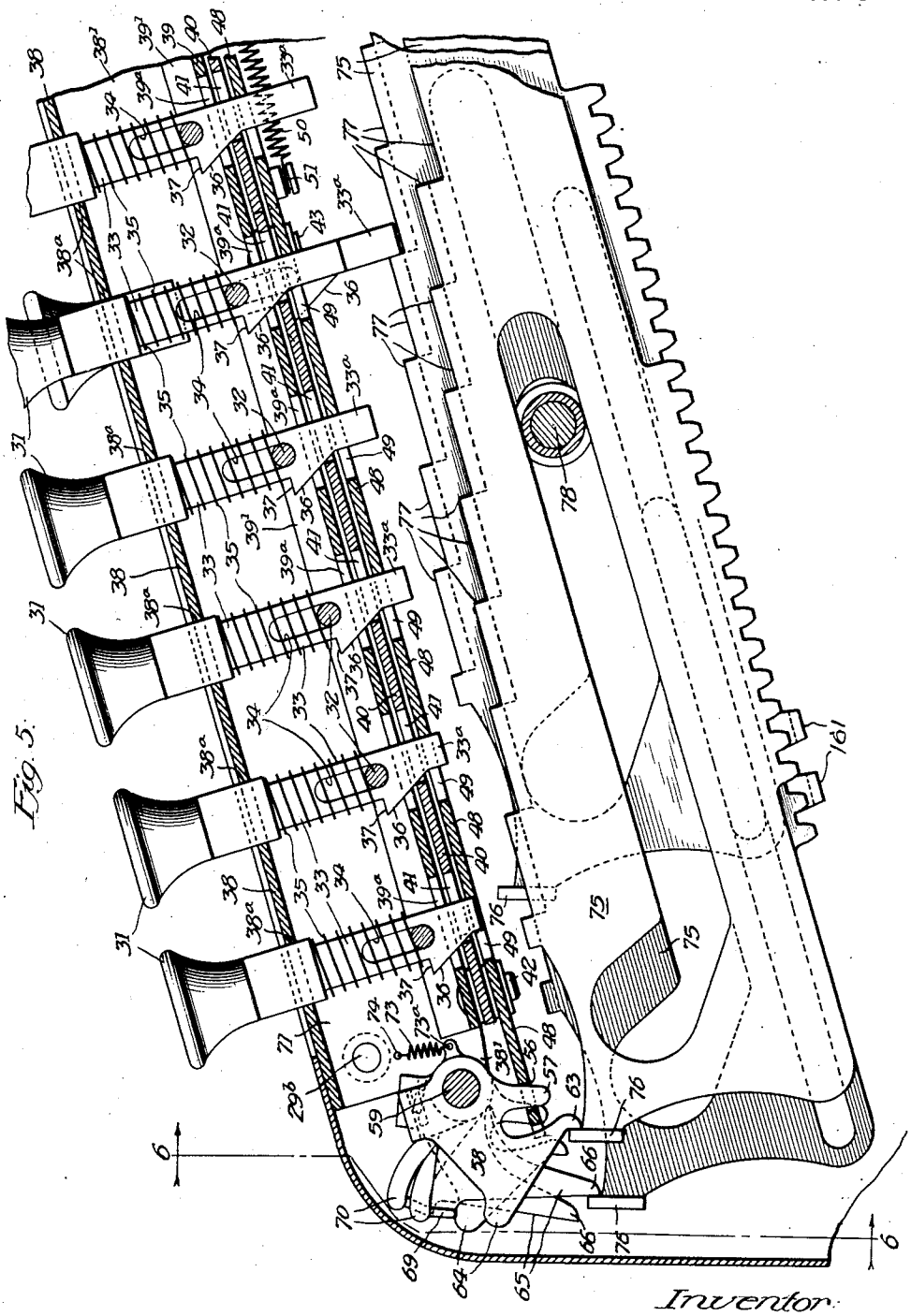


Fig. 5.

Witness:
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Aug. 31, 1937. M. GARBELL 2,091,778

KEYBOARD CONSTRUCTION AND KEY CONTROL

Original Filed March 24, 1934 8 Sheets-Sheet 5

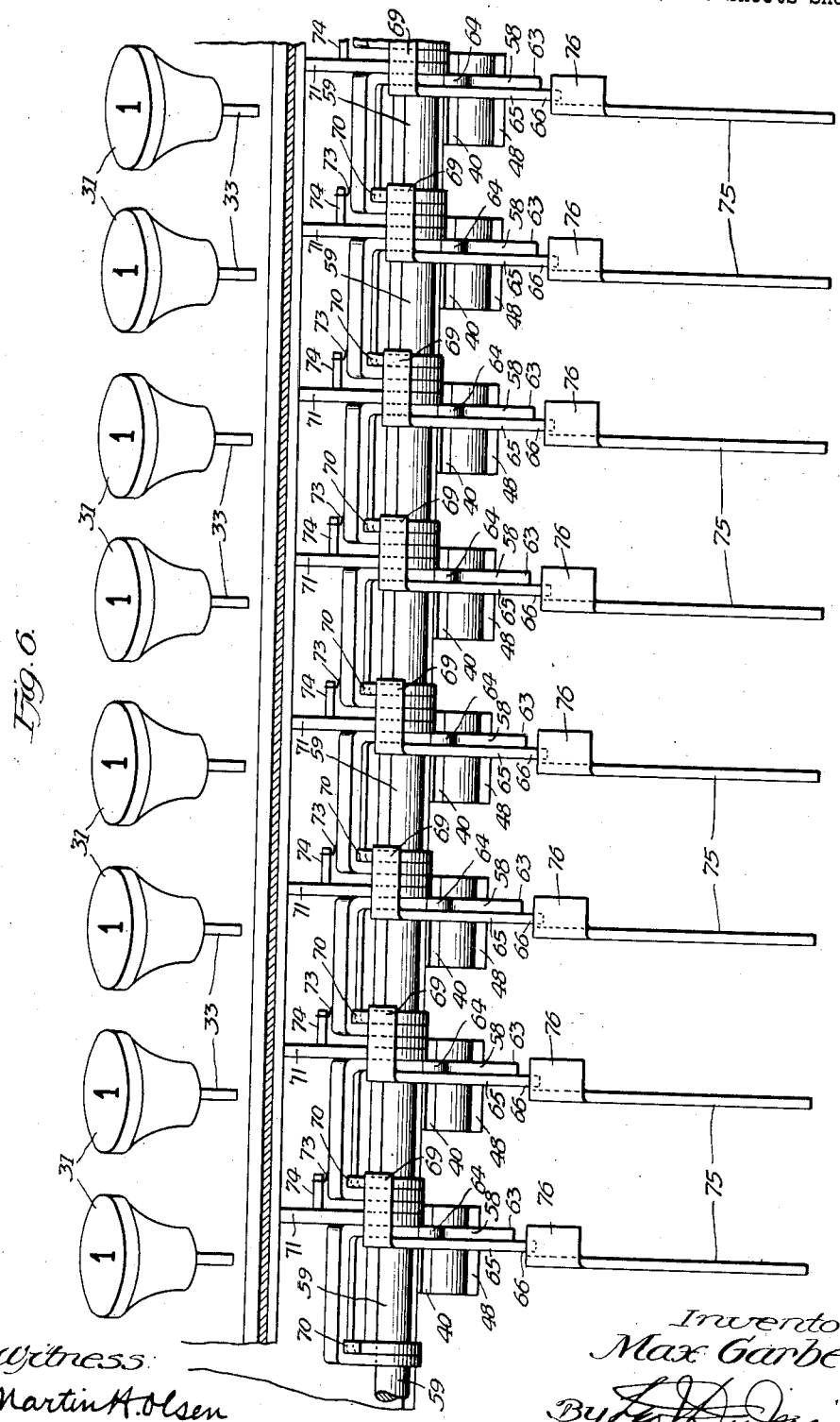


Fig. 6.

Witness:
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KEYBOARD CONSTRUCTION AND KEY CONTROL

Original Filed March 24, 1934 8 Sheets-Sheet 6

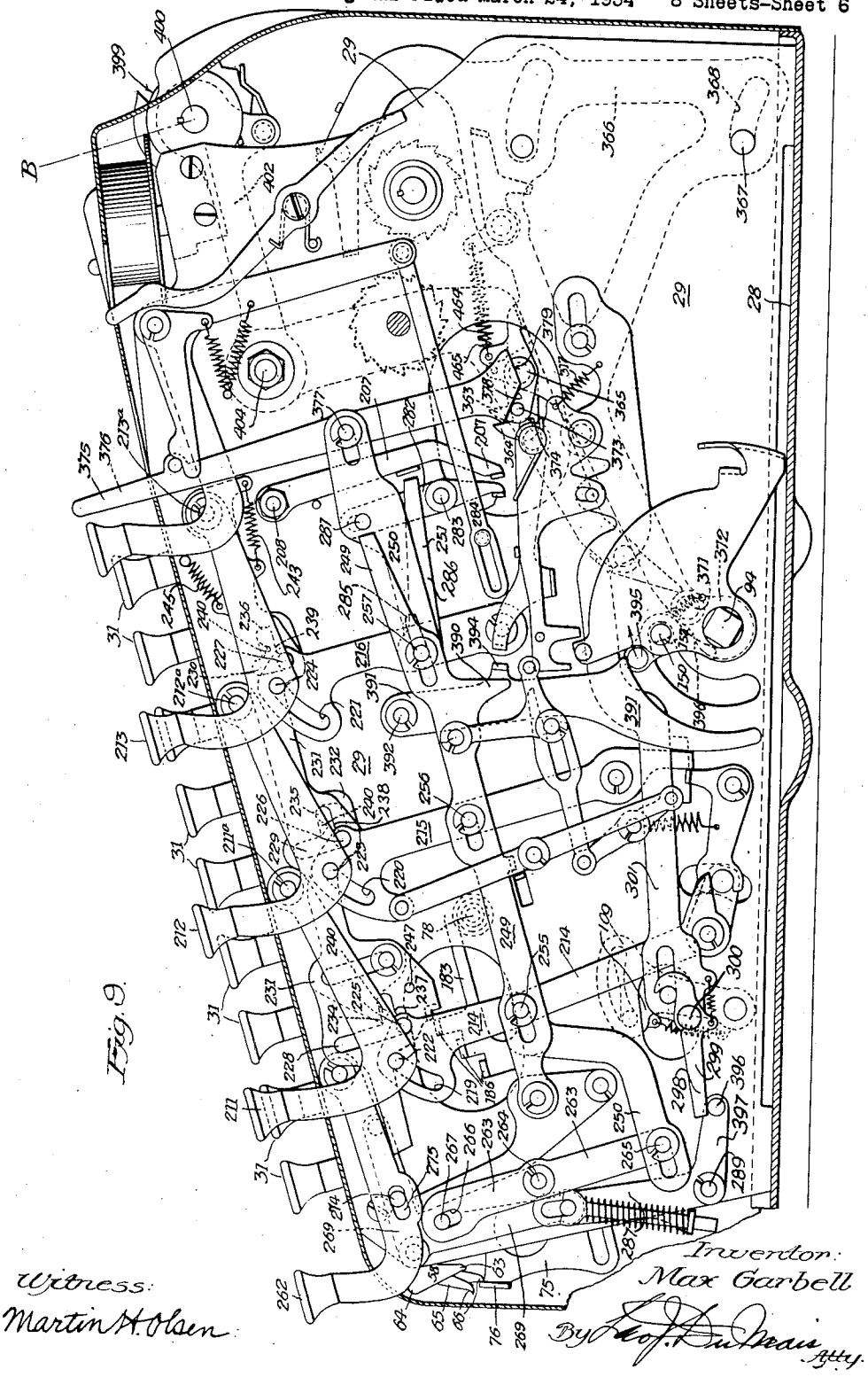


Fig. 9.

Witness:
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Aug. 31, 1937. M. GARBELL 2,091,778

KEYBOARD CONSTRUCTION AND KEY CONTROL

Original Filed March 24, 1934 8 Sheets-Sheet 7

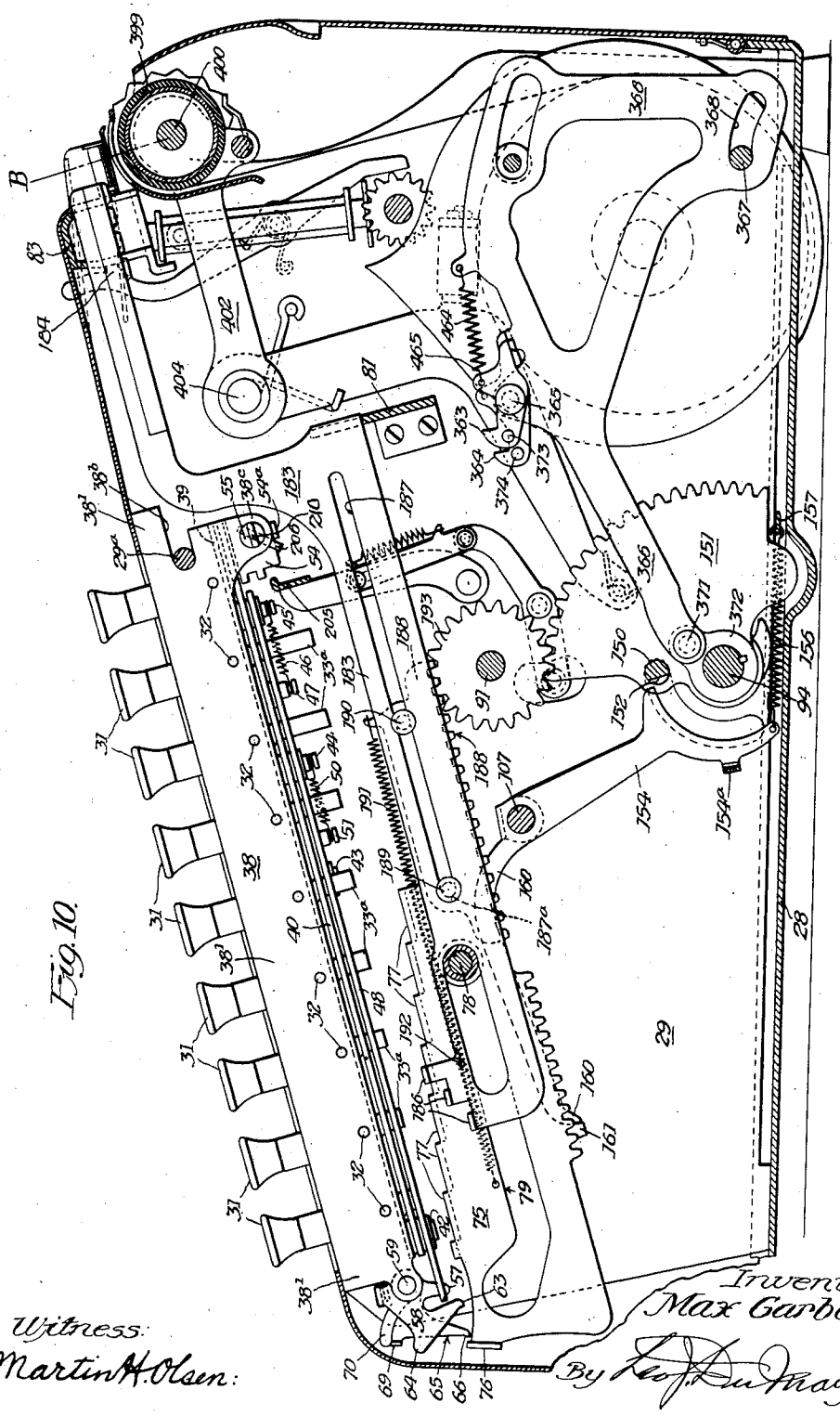


Fig. 10.

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Aug. 31, 1937. M. GARBELL 2,091,778

KEYBOARD CONSTRUCTION AND KEY CONTROL

Original Filed March 24, 1934 8 Sheets-Sheet 8

Fig. 11.

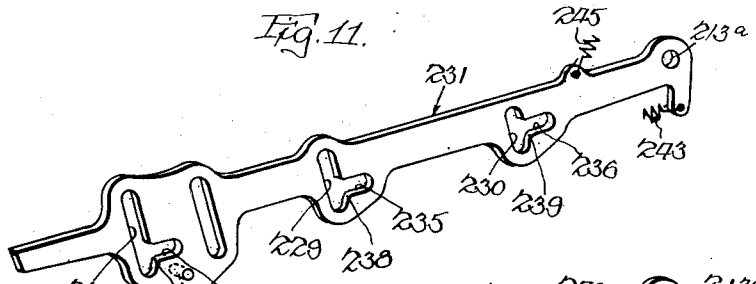


Fig. 12.

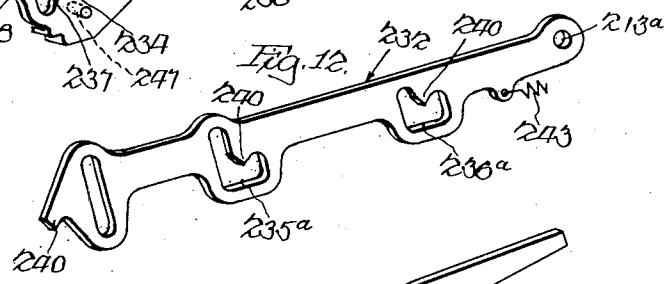


Fig. 13.

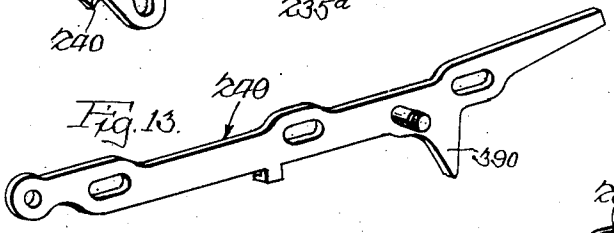


Fig. 14.

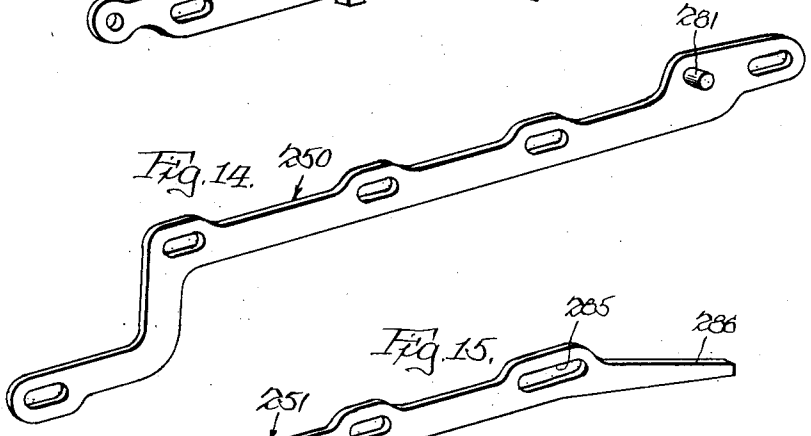


Fig. 15.

Witness
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Inventor:
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By Thos. J. DeGrace Atty.

Patented Aug. 31, 1937

2,091,778

UNITED STATES PATENT OFFICE

2,091,778

KEYBOARD CONSTRUCTION AND KEY CONTROL

Max Garbell, Chicago, Ill., assignor to Victor Adding Machine Company, Chicago, Ill., a corporation of Delaware

Original application March 24, 1934, Serial No. 717,156. Divided and this application November 7, 1934, Serial No. 751,812

8 Claims. (Cl. 235—60)

This invention relates to improvements in adding and recording machines and more particularly to the keyboard construction and key controls.

Among the many advantages are the construction of a keyboard having keys arranged in banks thereon and carried as a unit that may be readily attached or detached from an adding machine or the like, and while attached, the depressing of the keys will control and limit the movements of the type bars or racks that are directly below each bank of keys.

The chief objects of the invention are the provision of a unitary keyboard provided with a series of banks of keys that are easily and readily assembled therein and which is adapted to be bodily positioned on an adding machine for controlling the movements of type bars or racks which coact therewith.

A further object is the provision of stops and locks carried on the keyboard and each controlled by a bank of keys for determining the positioning of the type bars or racks during the operation of the machine.

A still further object is the provision of locking means for retaining the actuated keys in their depressed position and being arranged and constructed to retain the last key depressed in locked depressed position and wherein the locking means of each bank of keys controls the releasing locks for the type bars or racks coacting therewith.

And a still further object is the provision of a plurality of slide members coacting with each bank of keys and under their control for effecting the positioning of the locks to determine the positioning of the type bars or racks and for releasably retaining the depressed key in its depressed position during the operation of the machine; to provide means on the keyboard under the control of the driving mechanism for effecting the release of the keys upon the completion of each operation of the machine.

Among other features are signal key controls and manually manipulative means for rendering them and and the keys of the keyboard ineffective with the driving mechanism to retain the depressed keys in their depressed positions for repeat operations of the machine.

Other and further objects will become apparent in the following description and more fully pointed out in the appended claims.

Referring to the drawings:—

Figure 1 is a perspective view of an adding machine showing my keyboard as attached thereto.

Figure 2 is a longitudinal sectional view taken substantially on the line 2—2 of Fig. 1.

Figure 3 is a longitudinal sectional view similar to Fig. 2 with one of the keys of the keyboard depressed and with the rack or type bar of the adding machine as advanced and engaged thereby.

Figure 4 is a detail side elevation of the keyboard.

Figure 5 is an enlarged longitudinal detail partial sectional view of the front portion of the keyboard and stops coacting therewith.

Figure 6 is an enlarged detail front elevation of the keyboard taken substantially on the line 6—6 of Fig. 5.

Figure 7 is a detail partial cross-sectional view through the keyboard taken on the line 7—7 of Figs. 2 and 4.

Figure 8 is a detail cross-sectional view taken substantially on the line 8—8 of Fig. 2 showing the means of supporting one end of the keyboard and the connection between the slide lock shaft and the operating mechanism.

Figure 9 is a longitudinal sectional view taken substantially on the line 9—9 of Fig. 1, showing the signal keys and the control keys in side elevation.

Figure 10 is a longitudinal sectional view taken substantially on the line 10—10 of Fig. 1, showing the signal bar controlled by the control keys.

Figure 11 is a detailed perspective view of the outer member operable by the signal keys for locking the same.

Figure 12 is a detailed perspective of the inner member which coacts with the outer member for locking the signal keys.

Figure 13 is a detailed perspective view of the outer shift member operable under the control of the signal keys.

Figure 14 is a detailed perspective view of the intermediate shift member operable by the signal keys; and

Figure 15 is a detailed perspective view of the inner shift member operable under the control of the signal keys.

The present application is a division of my prior application, Serial No. 717,156, filed March 24, 1934, for improvements in adding and recording machines, and only so much of the machine shown and described in said application as is necessary for a full understanding of the subject matter claimed in this divisional application will be shown and described. The reference numerals appearing in the prior application have been employed to designate the corresponding parts herein.

In the construction of the adding machine

shown in the drawings, the numeral 28 designates the base which has vertically extending side walls 29 on which the operating mechanism of the machine is carried.

I have shown the full type of keyboard in illustrating my invention which has the keys 31 provided with key stems 33 and arranged for vertical movements on transversely extending rods 32 which extend through vertical elongated slot openings 34 in each of the key stems 33 and which are retained in the frame of the keyboard formed of a top member 38 and a bottom member 39. Each of these members 38 and 39 are provided with openings 38a and 39a respectively through which the keys 31 extend outwardly on each side thereof. The upper portion of these keys are provided with finger buttons that extend through the openings 38a of the top member and which serve as shoulders against which a compression spring 35 rests while their other ends rest on the rod 32 for normally retaining the keys in raised position.

The top and bottom member 38 and 39 are of channel formation having the flanges 38' and 39' respectively forming side walls thereon. Each of the rods 32 extends through the slot openings 34 of an aligned row of keys and is supported in and extends through the flanges 38' and 39' of the top and lower members 38 and 39 and with its ends flush with the outer surfaces of the flange 38' and also serves to secure the top and bottom members together.

Each of the key stems 33 of the keys 31 is provided with an inclined edge surface 36 which forms a cam thereon and which provides a shoulder 37 at its upper end portion. A relatively narrow slide member 40 is carried below each row of keys 31 on the bottom member 39 for sliding movements on a plurality of studs 42, 43, 44, and 45, and are each provided with a plurality of slot openings 41 through which the ends 33a of the key stems 33 extend. The slide 40 is normally urged in one direction by means of a tension spring 46 connected thereto on a stud 47 and to the fixed stud 45. Aligned with the slide 40 is a second slide 48 which is also provided with slot openings 49 that are normally aligned with the slot openings 41 of the slide member 40. This slide 48 is also urged in the same direction as the slide 40 by means of a tension spring 50 fixed thereto on a stud 51 and to the fixed stud 44 secured to the lower member 38.

While the keys are in their normal positions, the ends 33a thereof extend through the slot openings 41 and 49 of the slide members 40 and 48 with their cam portions 36 normally in position to engage the forward edge of the slot openings of the slides 40 and 48 respectively. As a key is depressed, the cam portion 36 thereof will cause a forward sliding movement of the slides 40 and 48 until the shoulder 37 of the key stem has passed below the slot opening 41 of the slide 40 at which time the tension spring 46 fixed thereto will cause this slide 40 to be returned to its normal position with the forward edge of the slot opening 41 over the shoulder 37 of the key stem and retain this key in locked depressed position (Figs. 3 and 5). While the key is in this depressed locked position, the apex formed by the cam 36 and the shoulder 37 abuts the forward edge of the slot opening 49 in the lower slide 48 and retains the same in the position to which it has been moved. The forward movement of the slide 40 causes a free rocking movement of a slide lock 54 that is connected thereto and carried on a shaft 55 which is pivotally mounted for rocking movements in depending ears 38c extending from the top member 38 of the keyboard. In each bank in which a key has been depressed, the slide 40 will be caused to shift forwardly and then will be returned to its normal position to lock the key, which will cause a rocking movement of a slide lock 54 connected thereto at 53 and which is carried on the shaft 55. A locking bar 205 is arranged to move into the path of the slide locks 54 upon each operating stroke of the adding machine for the purpose of locking these slide locks with the slides 40 to prevent the accidental depression of a key. These slide locks 54 are each provided with an ear 54a which normally engages a pin 206 in the slide lock shaft 55 and permits of a free movement of each of the slide locks in one direction, and while in their normal positions, they are in engagement with the pins 206.

During the time a key is depressed and is withheld in locked position (Figs. 3 and 5), the lower slide 48 is retained in its shifted position against the tension of the spring 50 and serves to actuate a zero stop 58 and a type bar stop 65 which coacts with a type bar or rack below each bank of keys.

The zero stop 58 and the type bar stop 65 are carried for rocking movements on a transversely extending shaft 59 which is supported in the side flanges 38' on the front end of the member 38 of the keyboard. These stops 58 and 65 are arranged in pairs and are each provided with a downwardly directed extension 63 and 66 respectively each of which normally depend in the path of travel of a type bar or rack of the machine. Each of the zero stops 58 are directly connected to the slide 48 by means of an ear 57 thereon extending into an opening 56 in this slide 48, and upon its movement, the zero stop 58 will engage the type bar stop 65. The zero stop 58 is provided with an extension 64 that is normally in spaced relation with a right-angled extension 69 which overhangs the same in spaced relation therewith so that a free movement of the zero stop 58 will be had before engaging and moving the type bar stop 65. The purpose of this free motion between the zero stop 58 and the type bar stop 65 is for positively moving the zero stop 58 out of the path of an ear 76 on the type bar 75 before the type bar stop 65 is moved. Each of the type bar stops 65 are provided with an angular formation 69 that overlies the extending portion 64 of the zero stop 58 and which also extends under an extending portion 70 of a type bar stop 65 in the adjacent bank of lower order and upon the movement of the slide 48 as above described, the type bar stop 65 of lower order will be rocked upwardly free of the extension 76 of its coacting type bar while permitting the extension 63 of the zero stop 58 coacting therewith to remain in the path of this extension 76. Each of the type bar stops 65 are yieldingly carried with the zero stop 58 against the tension of a spring 73 fixed to an ear 73a thereon and to a pin 74 fixed in a partition wall 71 that extends between each of these units and serves as a spacer therefor. The tension spring 73 retains the portion 70 of the zero stop 65 in the adjacent bank of lower order in yieldable engagement with the right-angled extension 69 in the bank of higher order.

In Fig. 6 it will be more readily seen how the extension 69 of the type bar stop 65 is engaged by the extension 63 of the zero stop 58 and also that

the extension 69 extends to the right as viewed from the front of the machine into the adjacent bank of lower order and under the portion 70 of the type bar stop in that bank.

Assuming that one of the digit keys 31 has been depressed in any one of the banks to the left of the first bank shown in Fig. 6, then all of the type bar stops to the right thereof will be carried out of the path of the extension 76 of each of the type bars 75 shown in this view. This permits of a normal given movement of the type bars in the banks of lower order of the keys depressed so that the type carried thereon will be automatically positioned into the printing line upon the operation of the machine.

It will be noted that the stops carried on the keyboard which coact with the type bars or racks are not connected thereto but merely extend into their path of travel, and as this unit is positioned on the machine, these stops will also be operatively positioned with the type bars or racks.

The keyboard unit is attached to the machine on a pair of studs 29*a* that are fixed to the side plates 29, and is securely held in position by means of screws 29*b* at its other end. The rearward end of the flanges 38' of the top member 38 of the keyboard are provided with bifurcated openings 38*b* which straddle the pins 29*a* and as the unit is forced rearwardly until these pins enter the bifurcated openings 38*b* thereof, the slide lock shaft 55 will be threaded into engagement with a stud 208 pivotally carried on the side plate 29. This stud 208 is provided with a slot opening 209 that receives a tongue 210 of the slide lock shaft 55 and when the keyboard is positioned on the machine, the shaft 55 and the stud 208 are aligned for turning movements with each other. The stud 208 has an arm 207 fixed thereto which depends into the path of movement of a pawl 363 which is pivotally carried on a skeleton frame 366 by means of a pin 365 and is yieldingly retained in raised position thereon by means of a spring 464. The skeleton frame 366 is pivotally connected for movements with the actuator shaft 94 of the machine on a collar 372 by means of a pin 371, and is carried for a forward and rearward sliding movement upon the operating and return stroke of the actuator shaft 94, being guided on a stud 367 fixed to the side plate 29 and which extends into an elongated slot opening 368 of the skeleton frame.

The depending arm 207 is engaged by the pawl 363 upon the return stroke of the actuator shaft 94 and causes a rocking movement of the stud 208 and shaft 55 which in turn causes the pins 206 carried on this shaft 55 to engage the ears 54*a* of the slide locks 54 and cause them to be carried therewith for a given distance. Each of the slide locks 54 are connected to a slide 40 by means of an ear 53, and as the shaft 55 is rocked by means of the engagement of the arm 207 with the pawl 363, a forward sliding movement of all of the slides 40 will be had. This forward sliding movement of the slides 40 will cause the forward edge of the slot openings 41 to be moved away from the shoulder 37 of the depressed keys 31 and render them free to be restored to their normal positions under the tension of their springs 35 and clear the keyboard. As the keys 31 are released to be restored to their normal positions, the cam surface 36 thereof will be carried out of engagement with the slot openings 49 in the lower slide 48 and permit this slide to be restored to its normal position by means of its spring 50 and will also restore the zero stops 58 connected thereto and the type bar stops 65 which are engaged thereby.

As shown in the drawings, each of the type bars 75 are provided with a plurality of steps 77 forming stops which abut the ends 33*a* of the depressed keys 31 for limiting its rearward movement over a platen 399 which is carried for turning movements with a shaft 400 that is journaled in and carried for bodily swinging movements on the arms 402 which are each fixed to a stud shaft 404 that are pivotally mounted on each of the side plates 29 of the machine. The type bars 75 are each provided with a set of type 82 arranged from 0 to 9 thereon which is positioned in a printing line B in accordance with the keys depressed for receiving an impact of the platen 399 to record the type of the selected type bars.

The type bars 75 are carried for reciprocating movements on a shaft 78 extending through an elongated slot opening 79 therein and at its other end in the combs 81 and 83. The type bars 75 are normally retained in locked position by means of an arm 160 which is pivotally carried on a shaft 107 and extends into the path of a lug 161 fixed to the type bar. The arm 160 has an integral depending arm 154 which extends into the path of travel of a shaft 150 which is pivotally carried for rocking movements and which is also bodily movable with the actuator shaft 94 so that upon the operation stroke of the machine, this shaft 150 will normally engage the arm 154 and rock the integral arm 160 therewith out of the path of the lug 161 of the type bar and release the same upon the starting stroke of the actuator 94 and permit the type bars that have been released from the type bar stop 65 to be carried for movement therewith until arrested by the zero stops 58 or the depressed digit keys 31. An arm 160—154 is provided for each of the type bars and they are also connected for movement with each other in their lower order by means of an extension 154*a* overlying the adjacent arm of higher order. These arms are retained in the path of the shaft 150 by means of a spring 156 attached thereto and to a cross-member 157. The shaft 150 forms an eccentric member when rocked and is adapted to be bodily moved for engagement or non-engagement with the lock arms 154 during the rocking movements of the actuator shaft 94.

Each of the type bars 75 is provided with a relatively long guide slot 84 which serves to guide a driving rack 85 for sliding movements therein by means of the studs 86 and 87 secured adjacent each end of the rack. A tension spring 88 is secured to the rack and to the type bar and serves to drive the type bar as the rack is moved. The racks 85 are each in meshing engagement with a rack gear 90 fixed for turning movements with the shaft 91 which has a similar gear fixed thereto that is adapted to be engaged by a segmental gear 93 fixed to the actuator shaft 94 and which is adapted to be brought into meshing engagement with the gear upon the movement of said actuator shaft for effecting a movement of the racks 85 and a movement of the released type bars 75 therewith. During total or sub-total operations, the arms 154—160 are released by the totalizer units when the totalizers are moved for engagement with the type bars. These totalizer units are not shown, but are clearly illustrated in the parent application, Serial No. 717,156 filed March 24, 1934.

A bank of signal keys are arranged for inde-

pendent movements adjacent one side of the keyboard and serve to control the positioning of a signal type bar and also control the positioning of mechanism coacting with the actuator shaft of the machine to effect the engagement and disengagement of totalizer units not shown, but which are clearly illustrated in my application, filed March 24, 1934, Serial No. 717,156. A pair of manually adjusted control keys or levers 375 and 376 are also arranged adjacent the keyboard and effect the positioning of the pawls 363 and 364 carried on the skeleton frame 366 to effect the release or non-release of a depressed signal key and the release or non-release of the digit keys of the keyboard upon the restoring operation of the actuator.

The signal type bar 183 is supported adjacent one side of the type bars 75 on the shaft 78 and in the combs 81 and 83 and is provided with a plurality of stops 186 for limiting its rearward movement to position the type 184 thereof in the printing line B over the platen 399. A rack 188 is slidably carried in an elongated slot opening 187 by means of a pair of studs 189 and 190 which are fixed to the rack 188 and which extend through the slot opening 187. A relatively long tension spring 191 is connected to the rack 188 and to a pin 192 fixed to the signal type bar 183 which urges this bar rearwardly so that the end 187a of the slot 187 thereof is retained against the stud 189 of the rack 188.

The signal type bar is independently driven by means of a gear 193 which is loosely mounted on the gear shaft 91 and is in meshing engagement with the rack 188. The gear 193 is also in meshing engagement with a control segment 151 fixed to the actuator shaft 94 so that upon each movement of the actuator shaft, the rack 188 will cause the movement of the signal bar 183 therewith when the same is released by the depression of one of the signal keys or when withheld, the rack may be moved in advance thereof against the tension of the spring 191.

The positioning of the signal type bar 183 for selectively positioning one of the type 184 thereon in the printing line is automatically accomplished by means of a stop pin 247 under the control of the signal keys which is adjustably positioned into the path of the stops 186 of the signal type bar and limit its rearward movement over the platen 399 in accordance with the signal key depressed.

The signal keys consist of a total key 211, a sub-total key 212 and a subtraction key 213 which are pivotally supported to the side wall 29 of the machine on the studs 211a, 212a, and 213a respectively. These keys are each connected to vertically extending levers 214, 215, and 216 by means of the pins 222, 223, and 224 respectively which are fixed to the respective keys and which extend into the cam slot openings 219, 220, and 221 respectively of the vertically extending levers. Each of the vertically extending levers is provided with a pin 225, 226, and 227 respectively which extend into the vertical slot openings 228, 229, and 230 of a pair of arm members 231 and 232 which are pivotally supported on the stud 213a and provide a scissor action to form a locking means for the pins 225, 226, and 227 respectively of the vertically extending levers. The outer member 231 is provided with horizontal slot openings 234, 235, and 236 positioned somewhat above the lower end of the elongated vertical slots 228, 229, and 230 and form cam shoulders 237, 238, and 239. The cam shoulders form means for depressing the member 231 as the pins or followers 225, 226, and 227 of the vertically disposed levers 214, 215, and 216 are caused to move as their respective signal keys are depressed. The horizontally extending slot openings 234, 235, and 236, respectively, connect with and extend rearwardly on one side of each of the vertical slot openings toward the pivotal center 213a, permitting the pins or followers of each of the vertical levers to be moved therein in a sidewise direction upon the depression of either the total, sub-total or subtraction keys. The horizontally extending slot openings 235a and 236a in the inner member 232 are arranged in side by side relation with the horizontal slot openings 235 and 236 in the member 231 and are relatively larger to permit of clearance for the movement of the followers 226 and 227 and are each provided with a depending V-shaped extension 240 on their top edge portion adapted to extend into the path of the followers. The free end of the member 232 is also provided with a V-shaped extension 240 that extends into the path of the horizontal slot opening 234 to engage the follower 225 in the same manner as those above described for the followers 226 and 227.

As one of the signal keys 211, 212, or 213 is depressed the corresponding follower will be moved therewith over the cam portion and abut the V-extension of the inner member 232 and cause the same to move upwardly until the follower has passed this V-extension and permit the member 232 to be drawn downwardly by means of its spring 243 connected thereto and to the outer member 231. The follower passing over the cam portion will force the member 231 to move downwardly until this follower is aligned with its respective horizontal slot opening and will be retained therein by means of the V-extension on the member 232.

As one of the signal keys is locked in the manner described, the remaining signal keys will be locked against depression by means of the movement of the member 231 under the control of the depressed key which positions the member 231 for misalignment with the remaining followers of the vertically extending levers. The misalignment being effective by the depression of any one of the signal keys which positions the remaining horizontal slot openings in the member 231 out of alignment with the remaining followers carried on the vertical levers.

The pair of members 231 and 232 are normally urged upwardly by means of a tension spring 245 connected to the member 231 and to the side wall of the machine. It will be noted that the spring 245 attached to the member 231 urges the same for an upward rocking movement on the pivot 213a while the spring attached to the member 232 urges the same downwardly on this pivot 213a and the spring 243 urges the members for a scissor-action in opposite directions while being yieldingly retained by the spring 245 for retaining the followers in the vertically aligned slot openings therein during their normal positions and for retaining them into the horizontal slot openings when actuated.

The vertically extending levers 214, 215, and 216 are operatively connected to shift members 249, 250, and 251 by means of the studs 255, 256, and 257 and are arranged to be moved rearwardly upon the depression of either of the signal keys 211, 212, or 213. The rearward movement of the shift members 249 and 250 effects the positioning of a restoring arm 282 which is connected for

movement with the shift member 250 at 281 and is adapted to be engaged by the member 249.

The inner shift member 251 is moved with the shift members 249 and 250 when the total or sub-total keys are depressed, but will remain dormant or in its normal at rest position when the subtraction key 213 is depressed. This shift member 251 is provided with an elongated slot opening 285 that extends rearwardly of the stud 257 on the vertical lever 216 and is of sufficient length to permit of a free movement of the stud therein as the vertical lever 216 is rocked upon the depression of the subtraction key 213. This shift member 251 has an extending portion 286 adapted to engage the depending arm 207 upon its movement for rocking the slide lock shaft 55 and causing a forward sliding movement of the slides 40 to release the digit keys.

A non-add key 262 is also connected with the shift member 250 by means of a bell-crank 269 which has a pin 274 fixed thereto that extends through a slot 275 in the key 262. The bell-crank 269 also has a pin 267 which extends through a slot 266 in a rocker arm 263 and which is pivoted to the side plate 29 on a stud 264 with its other end connected to the shift member 250 by means of a pin 265. The bell-crank 269 is also operatively connected to a bell-crank 287 that is pivoted to the side plate 29 on a stud 289 and which has a leg 397 that carries a pin 396. The pin 396 normally engages the extension 298 of a hook member 299 carried on a control member 301 by a pin 300. This hook member 299 serves to connect the control member 301 with a regulating device 109 that is operatively connected to effect the engagement and disengagement of the totalizer units (not shown) with the type bars 75, as the control member 301 is moved upon the operation of the machine. As the non-add key 262 is depressed, the bell-cranks 269 and 287 will be rocked and the pin 396 will rock the hook member 299 to disengage the regulating device 109 from the control member 301, which permits the totalizer units to remain in their normal positions out of engagement with the type bars, so that, as the machine is operated, the amounts set up in the keyboard will not be run into the totalizer units.

The restoring arm 282 is pivotally supported on the side plate 29 by means of a stud 283 with its lower free end portion 284 adapted to be engaged by the pawl 364 carried on the pin 365 adjacent the pawl 363 on the skeleton frame 366.

During the normal operations of the machine, the pawls 363 and 364 are adapted to engage the arms 207 and 282 respectively for causing a rocking movement thereof to restore the depressed digit keys 31 to their normal positions and to restore the shift members and the vertically extending lever to its normal position which will cause the depressed signal key coacting therewith to be released and restored to its normal position.

The keys or levers 375 and 376 are pivotally carried for rocking movements on the stud 377 fixed to the side plate 29 and have their lower end portion formed with a cam surface 378 and a dwell 379 which are adapted to engage the pins 373 and 374 respectively of the pawls 363 and 364. While in their normal positions, the levers 375 and 376 are free of engagement with the pins 373 and 374 of the pawls, and when moved, the cam surfaces 378 riding over these pins 373 and 374 will cause these pawls 363 and 364 to be rocked downwardly against the tension of their springs 464 and 465 and will be retained in that position by means of their contact with the dwell 379 of the levers 375 and 376. These levers 375 and 376 may be moved independently of each other for selectively positioning the pawls 363 or 364 into or out of engagement with their respective arms 207 and 282. The movement of the lever 375 permits the digit keys 31 to remain depressed for repeat operations of the keyboard or to be cleared when this lever remains in its normal position. The movement of the lever 376 permits the signal key depressed to remain depressed for repeat operations or to be cleared when this lever remains in its normal position.

The shift member 249 is provided with a depending lug 390 which is adapted to be brought into engagement with an ear 394 extending into the path thereof and which is formed integrally on a depending arm 391 which is adapted to normally engage a stud 395 fixed to a bell-crank 396 which is secured to the shaft 150. The movement of the shift member 249 controls the movement of the depending arm 291 to cause a pivotal movement of the shaft or eccentric member 150 to position the flattened portion 152 thereof toward the depending arms 154 and prevent their engagement with this shaft 150 as the same is caused to be bodily moved upon the movement of the actuator shaft 94. As the flattened portion 152 of the shaft 150 is in this turned position, the arms 154 will remain in their normal positions and retain the integral arm 160 thereof in locked position with the lug 161 of the type bars 75 and prevent its movement with the operating mechanism upon the movement of the actuator shaft 94.

While I have described and shown my invention in its preferred form, there are many changes and variations which may be made without departing from the spirit thereof, and I desire to include all such changes and variations within the scope of my claims.

I claim:—

1. In an adding machine, the combination of a driving mechanism with a plurality of type bars operable thereby, lock arms normally preventing movement of the type bars, said lock arms having depending portions thereon, a member carried by the driving mechanism and normally in the path of said depending portions to engage the same with and rock the lock arms to release said lock arms from the type bars upon the operating stroke of the driving mechanism.

2. The combination of a series of independently movable type bars, a platen, driving means for moving the type bars with respect to the platen, a releasable type bar lock arm normally retaining each type bar in locked position, shift members, a bank of keys controlling the movements of the shift members, a pivotally supported bodily movable member operable from the driving means adapted to normally engage said lock arms to effect their release from the type bars, and means under the control of the shift members for rendering said movable member ineffective with respect to said lock arms.

3. In an adding machine of the character described, the combination of a driving mechanism and sliding type bars adapted to be reciprocated thereby, a lock arm retaining each type bar locked in normal position, a pivotally mounted member carried by the driving mechanism adapted when bodily moved to engage and release the lock arms, shift members, keys controlling the movements of said shift members, and means coacting with said shift members positioning said pivotally mounted member to be free of said lock arms.

4. The combination of independently movable type bars, a platen, a driving mechanism for moving the type bars with respect to the platen, a type bar lock arm engageable with and retaining each type bar in normal locked position, shift members, keys controlling the movements of the shift members, a pivotally mounted member having a relieved portion thereon and being adapted when bodily moved to engage the lock arms and effect their release from the type bars upon the movement of the driving mechanism, a positioning arm controlling the pivotal position of said mounted member, and means under the control of said shift members to effect a rocking movement of said arm and pivotally mounted member and to position the relieved portion of the latter to clear said lock arms.

5. The combination of a driving mechanism and a plurality of sliding type bars adapted to be reciprocated thereby, a lock arm coacting with and retaining each type bar locked in normal position, a member carried by the driving mechanism and normally in the path of said lock arms to release them from the type bars upon each movement of the driving mechanism, a bank of keys, and means under the control of the keys to render said member ineffective with respect to said lock arms.

6. In an adding machine, the combination with an invariably movable driving mechanism and a plurality of slidably movable type bars operable thereby, a bank of depressible keys, lock arms normally withholding said type bars from movement, a member carried by the driving mechanism normally capable of engaging said lock arms upon operation of the driving mechanism to disengage said lock arms from the type bars, and means including a slide connecting the keys with said member whereby upon the depression of any of said keys the member will be free of said lock arms.

7. In a machine of the character described, the combination with a driving mechanism and a plurality of type bars operable thereby, lock arms normally retaining each type bar in locked position, a member carried by the driving mechanism adapted to normally engage and release the lock arms from the type bars, extensions on the lock arms arranged in such manner as to engage the adjacent arm of higher order whereby the movement of one of the lock arms will effect movement of those of lower order thereof, and means to adjust said member to render it ineffective with respect to said lock arms.

8. The combination of a driving mechanism and a signal type bar having characters thereon, a bank of depressible keys controlling the movements of said signal type bar to position a character thereon in a printing line, means coacting with the signal keys for locking the same when depressed and retaining the remaining signal keys inoperative, said means comprising a pair of members pivotally carried for movement with and independently of each other, lever means one for each signal key operated on depression thereof and cooperating with said members, one of said members being provided with cam means engageable by said lever means to prevent depression of more than one signal key at a time, and the second member having means to retain said lever means in either normal or operated position, and means operatively connected with each of the lever means and operated by the actuating mechanism of the machine for restoring said lever means when latched by one of said members to permit the return of a depressed signal key.

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