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PATENTED FEB. 20, 1906.

I. S. DEMENT & F. J. HULL.
 KEYBOARD LOCKING MECHANISM FOR MECHANICAL CASHIERS,
 REGISTERS, AND RECORDERS.

APPLICATION FILED OCT. 3, 1901.

4 SHEETS—SHEET 1.

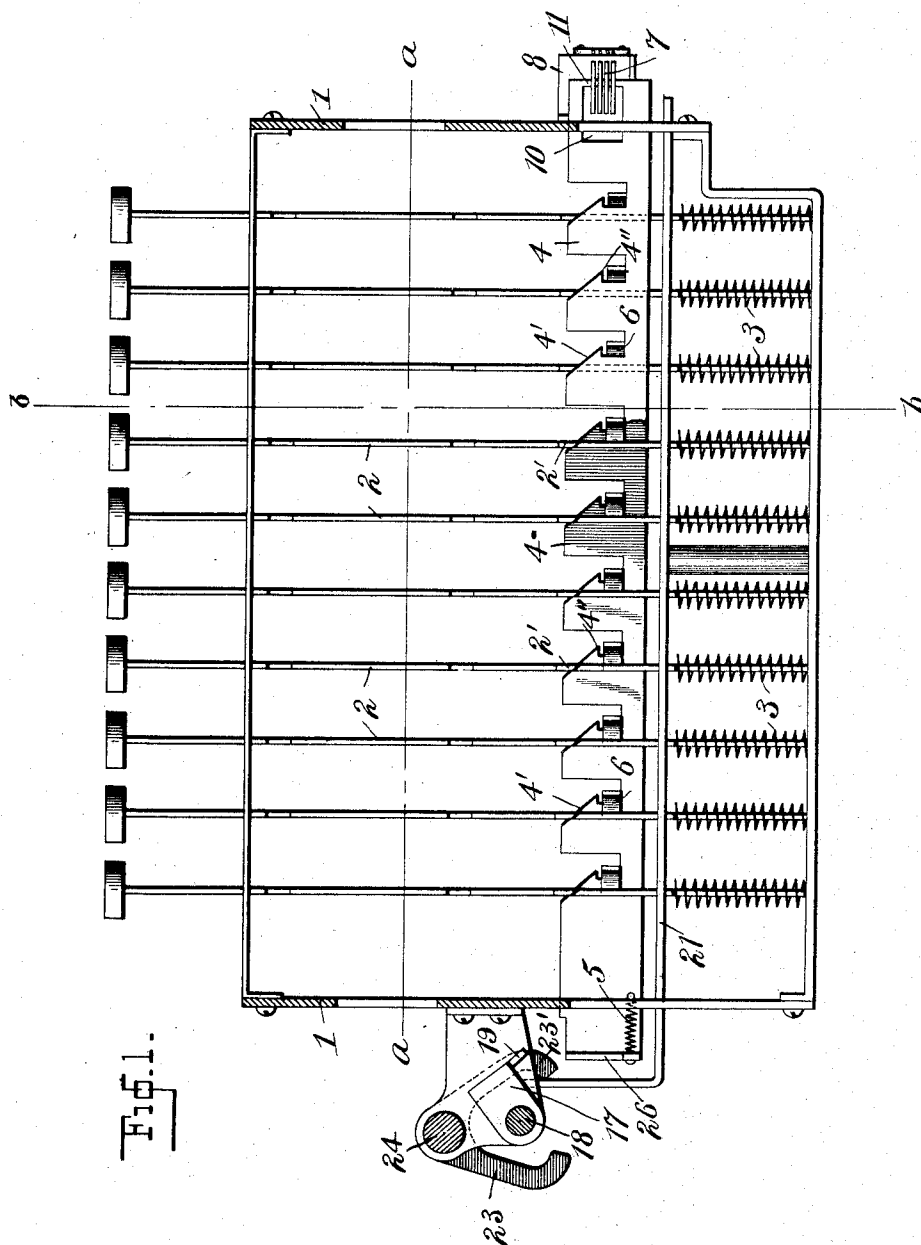


Fig. 1.

Witnesses.
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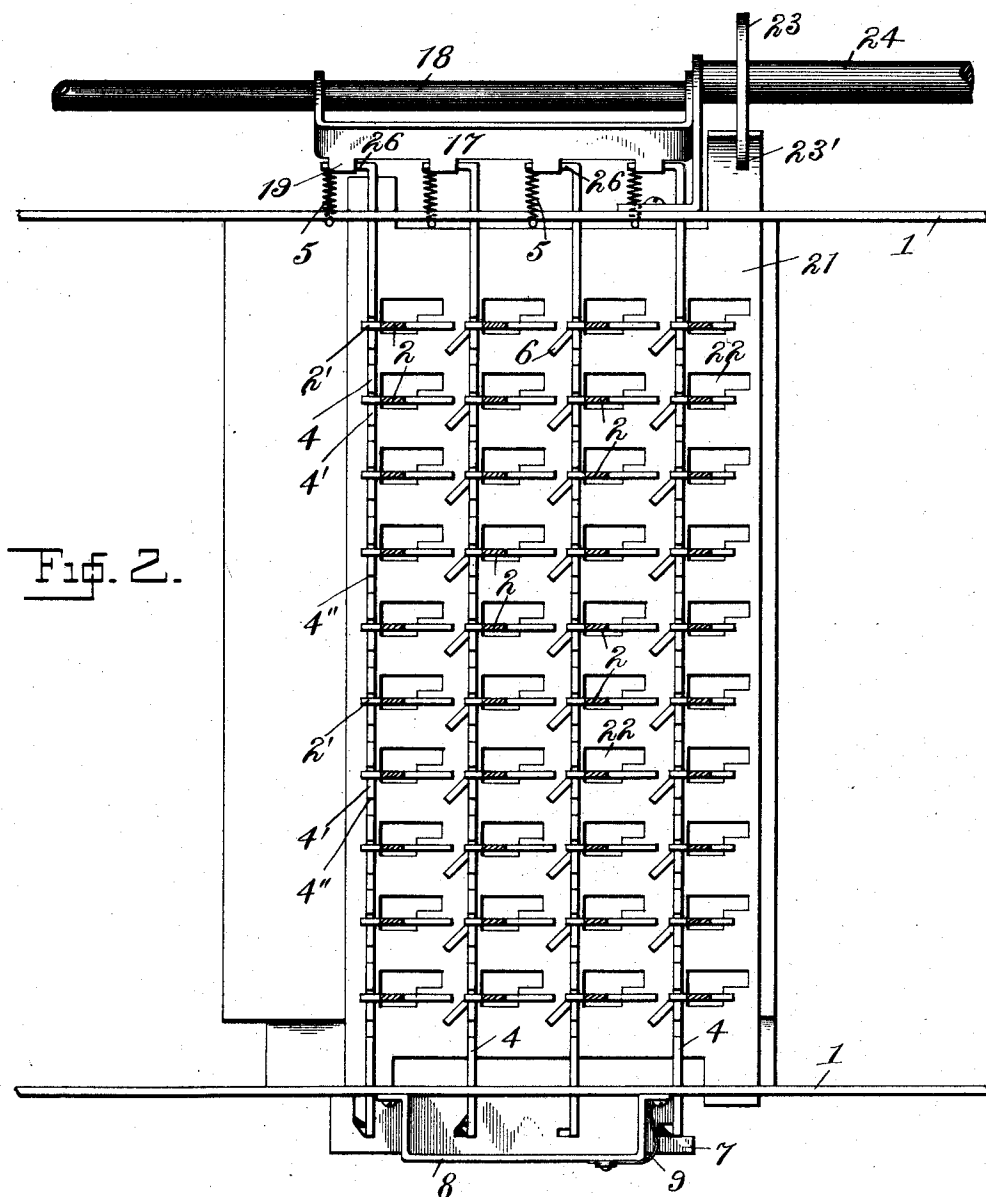


Fig. 2.

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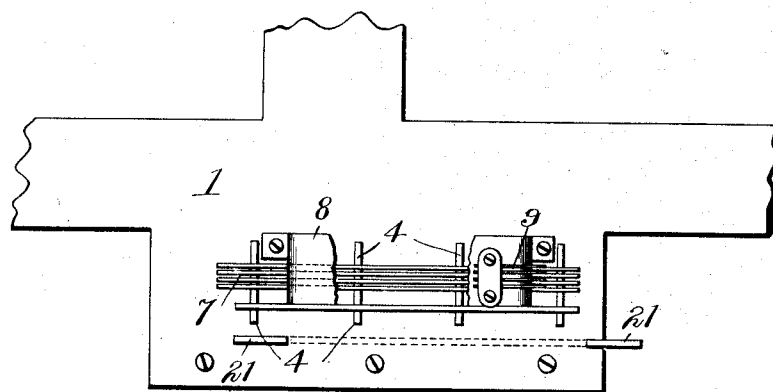
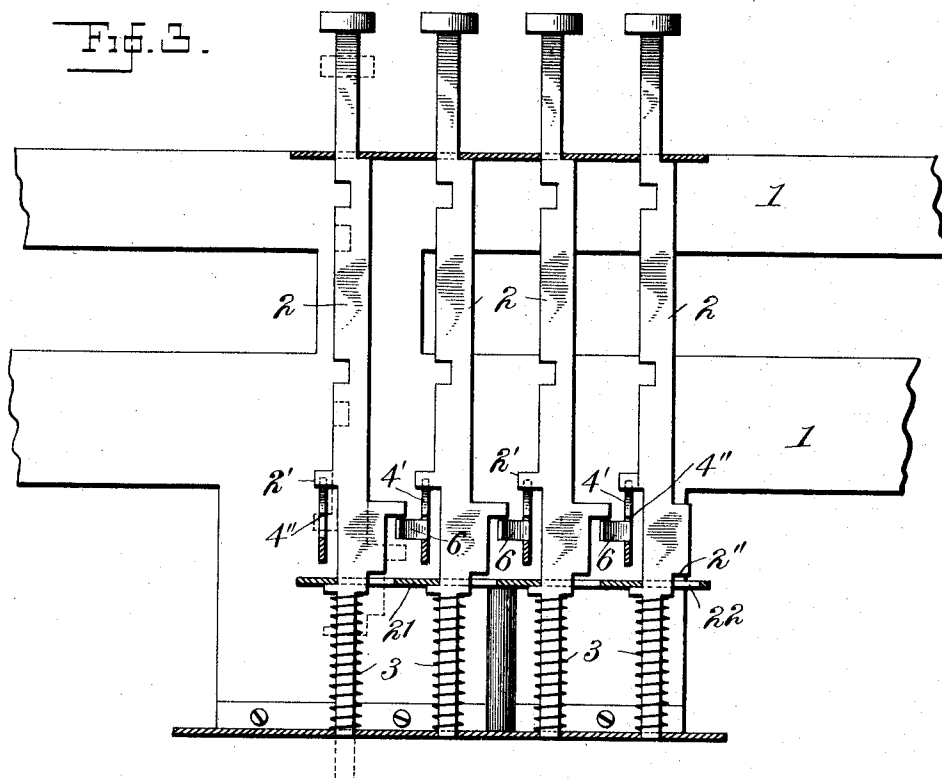
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4 SHEETS—SHEET 3.



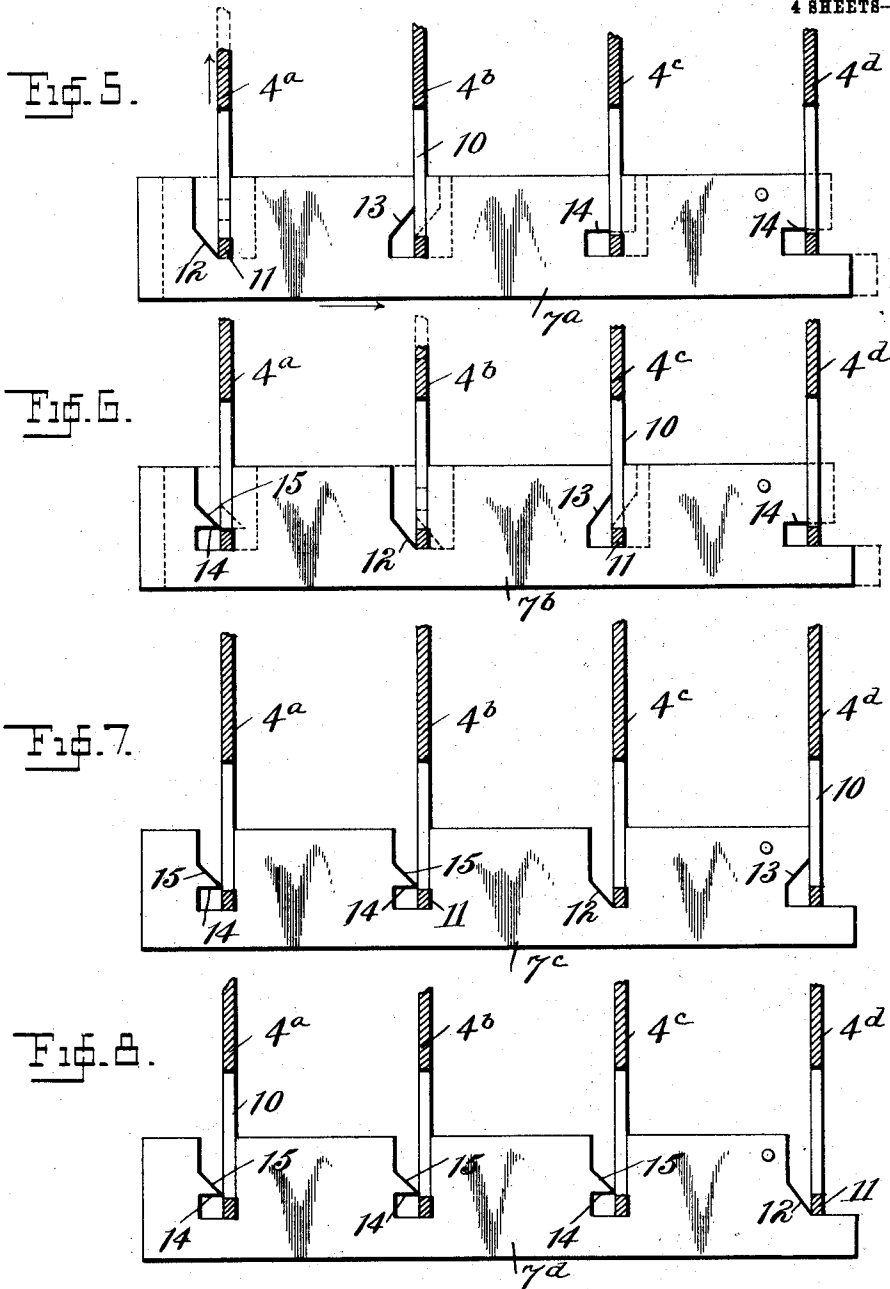
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

ISAAC S. DEMENT, OF EAST ORANGE, NEW JERSEY, AND FOSTER J. HULL, OF BROOKLYN, NEW YORK, ASSIGNORS, BY MESNE ASSIGNMENTS, TO CITY TRUST COMPANY OF NEW YORK, TRUSTEE, A CORPORATION OF NEW YORK.

KEYBOARD-LOCKING MECHANISM FOR MECHANICAL CASHIERS, REGISTERS, AND RECORDERS.

No. 813,360.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed October 3, 1901. Serial No. 77,473.

To all whom it may concern:

Be it known that we, ISAAC S. DEMENT, residing at East Orange, in the county of Essex and State of New Jersey, and FOSTER J. HULL, residing at Brooklyn, in the county of Kings and State of New York, citizens of the United States, have invented certain new and useful Improvements in Keyboard-Locking Mechanism for Mechanical Cashiers, Registers, and Recorders, of which the following is a specification.

This invention relates to locking means for the keyboard mechanism of mechanical cashiers, registers, and recorders. In such apparatus it is in some cases desirable that the keys for the different denominations should be operated in a predetermined order, say in descending order of thousands, hundreds, &c. To insure this and prevent the operation of the keys except in such order is the object of the present invention. For this purpose we provide locking devices controlled by the requisite groups of keys and acting when a key of any group is operated to prevent operation of certain of the other groups of keys. We also provide dogging devices that prevent the simultaneous operation of keys of different groups.

In the accompanying drawings, Figure 1 is a side elevation of the keyboard with its supporting-frame in section. Fig. 2 is a horizontal section of same on the line *a a* in Fig. 1. Fig. 3 is a vertical transverse section on the line *b b* in Fig. 1. Fig. 4 is a front elevation, partly broken away. Figs. 5, 6, 7, and 8 are detail sectional views of the locking devices proper, taken, respectively, in the plane of the several locking devices.

The keyboard mechanism herein shown is intended for use with cash-registers, recorders, mechanical cashiers, and similar apparatus wherein certain operations are to be performed under the control of keyboard mechanism comprising keys arranged in denominational or departmental groups. As the construction of the cashier, register, or recorder mechanism to which this keyboard is applied forms no part of the present invention, we have not shown it herein, but have shown only the keyboard mechanism itself,

it being understood that connections will be made therefrom to the controlled apparatus to properly operate same.

1 represents the frame of the machine, in which is mounted the mechanism of the keyboard, said mechanism comprising keys 2, sliding in guides in said frame and pressed to normal or upper position by springs 3. These keys are arranged in groups or rows for different denominations, as units, tens, &c., or for denominations and departments. For each row or group of keys we provide a slide 4, the several slides 4 being guided in the vertical plates of frame 1 and being pulled forward by springs 5. Each slide 4 is provided with inclines or cam portions 4', adapted to be engaged by the lugs 2' on the respective keys of the corresponding group, so that depression of any of such keys will force the slide rearwardly. At the foot of this incline or cam portion is a notch or shoulder 4'', adapted to engage the lug 2' of the depressed key and hold the key down, the slide 4 snapping forward sufficiently for this purpose by the action of its spring 5.

The locking mechanism forming the subject of the present invention is adapted to insure the operation of the slides in a certain order by causing the operation of any one slide to lock other of the slides. It is here shown as adapted to insure operation of the keys of different denominations in descending order only—that is, from left to right. This is effected by dogging lugs or wings 6 on the respective slides 4 and by locking-slides 7, arranged to cooperate with all the slides 4. The wings 6 project obliquely sidewise on the left of each of the slides 4 and extend in proximity to but a little to the front and below the bottom of a key of the next group to the left—that is, of next higher denomination—so that as any key is depressed and moves a slide 4 rearward it will bring the wings 6 of that slide under the keys of the next group, so as to prevent depression of such keys. Even if the latter keys be struck at the same time they will not be able to reach their fully-operated position before being intercepted by these wings. The wings 6 therefore serve as means to prevent simultaneous operation

of keys of adjacent groups. They also serve on the operation of a key of any group to lock the next group to the left, and for such purposes they may in some cases be sufficient without the use of locking-slides 7. These wings may of course be omitted from the left-hand slide 4, as shown.

Locking-slides 7 are arranged at the front of the machine, lying flatwise one above another and sliding in guide plate or bracket 8. These slides 7 are pushed to the right by springs 9. Each slide 7 has four notches or slots 10, which receive and cooperate with the forward ends of slides 4, each of which is slotted to form an open frame, hook, or bail, the vertical or front bar 11 of same entering a notch or slot 10 in each of the locking-slides 7, so that all of the said slides cooperate with all the slides 4. In Figs. 5 to 8 are shown the forms of the respective slides 7, which for distinction are here marked 7^a 7^b 7^c 7^d, corresponding to thousands, hundreds, tens, and units, the slides 4 being similarly distinguished. Each slide 4^a 4^b, &c., operates a particular one of the locking-slides 7^a 7^b, &c., and the operation of each slide 7^a 7^b, &c., serves to lock certain of the unoperated slides 4^a 4^b, &c. The shape of these notches is shown for the respective slides 7^a to 7^d in Figs. 5 to 8. All the slots are so formed as to permit normally of a free passage rearward of the bars 11 of all the slides 4, so that any key on the board may be struck first. In each slide 7 one of the slots 10 is an operating-slot, another (the next to the right) is a resetting-slot, and the remainder are locking-slots. Thus for the thousands-slide, Fig. 5, the first slot on the left is cut obliquely away from the bar 11 toward the back, as shown at 12, so that when the bar 11 moves rearward with slide 4^a on operation of a thousands-key the slide 7^a will be thrown to the right by its spring 9. The next slot 10 to the right has an incline 13, which extends rearwardly toward the bar 11, so that while the said bar 11 is normally free of the incline the latter will pass in back of said bar when the slide 7^a is released, as stated, so that slide 4^b is not locked; but if it is operated it will reset the slide 7^a. The other notches or slots have offsets or shoulders 14, which when the slide 7^a is moved to the right engage back of the bars 11 and prevent operation of the corresponding slides 4^c 4^d. Thus the operation of thousand-slide 4^a will lock the tens and units slides 4^c 4^d, but will leave the hundreds-slide 4^b free to operate, and if slide 4^b is then operated it will reset the locking-slide 7^a. The slide 7^b has in its second slot 10 a releasing-incline 12, cooperating with the hundreds-slide 4^b, and said slide 7^b also has a resetting-incline 13, cooperating with the tens-slide, and shoulders 14, cooperating with the thousands and units slides. The releasing-

incline 12, resetting-incline 13, and locking-shoulders 14 of the tens-slide 7^c are shown in Fig. 7, and in Fig. 8 are shown the releasing-incline 12, controlled by the units-slide 4^d, and the locking-shoulders 14, controlling the slides 4^a 4^b 4^c, no resetting-incline in this case being necessary.

Means are provided for resetting the slides 4, and each slide as it is reset cooperates with inclines 12 and 15 in the respective notches 10 to reset such of the slides 7 as have not been reset by the inclines 13. For thus resetting the slides 4 we provide a bail 17 on a resetting-shaft 18, operated by suitable handle mechanism. If the slides 4 are in normal position, the flanges 26 on their rear ends are free of lugs 19 on the bail 17 as the latter is swung rearward and forward by the handle means; but if any slide 4 has moved backward and is caught by the operated key engaging under its hook 4" as said slide moves slightly forward then in the next rearward movement of bail 17 a lug 19 thereon will engage the flange 26 of such slide 4 to move it back again to its rearmost position and will release the operated key from hook 4". Key 2 will then spring up to normal position, and as the resetting-bail 17 turns forward again the slide 4 resumes its normal position.

A universal lock-plate 21 is shown for all the keys, said plate sliding in frame 1 and having slots 22, through which the keys pass. Normally shoulders 27 on the keys are above the edges of the slots, so as to prevent operation of the keys; but on forward movement of plate 21 an enlarged part of each slot 22 is brought under the corresponding key, so as to permit same to be operated. This plate 21 is operated by arms 23 23' on a shaft 24, which may be connected to any controlling device whose operation is desired to be precedent to operation of the keyboard.

The keys 2 are connected to operate cashier, register, or recorder mechanism in any usual or suitable manner.

It will be understood that where the operation of the interlocking mechanism between the several groups of keys is described and claimed the universal locking mechanism for all the groups is not to be lost sight of, it being understood that until the universal locking mechanism has been released none of the keys or groups can be operated, but that after release of the universal locking mechanism any key in any group may be operated initially and that the operation of any key initially operates the interlocking mechanism between the groups.

Having thus described our invention, the following is what we claim as new therein and desire to secure by Letters Patent:

1. A keyboard mechanism for the purposes described comprising groups of keys representing different denominations, the keys of

different groups being capable of operation in a predetermined order of sequence, means actuated by any key of one group to lock the keys of groups out of said predetermined order of sequence.

2. A keyboard mechanism for the purposes described comprising normally unlocked groups of keys representing different denominations, the keys of different groups being capable of operation in a predetermined order of sequence, means actuated by any key of one group to lock the keys of the next group out of said order of sequence.

3. A keyboard mechanism comprising a plurality of groups of keys, each group representing a member of a serial order and any key in any group being capable of initial operation, in combination with locking means operative by the actuation of any key in any group to lock all the other groups except one.

4. A keyboard mechanism for the purposes described, comprising keys arranged in groups of different denominations and devices controlled by the operation of each group to lock the keys of the groups of lower denominations except the adjacent group.

5. A keyboard mechanism for the purposes described comprising groups of keys representing different denominations, the keys of different groups being capable of operation in a predetermined order of sequence, and devices controlled by the operation of each group to lock the keys of all the other groups except the one next in said predetermined order of sequence.

6. A keyboard mechanism comprising a plurality of keys arranged in groups, any key of which is capable of initial operation, an interlocking mechanism acting upon all the groups and controlling the order of their operation, said interlocking mechanism operated by any key of any group to lock all the other groups of keys except one.

7. A keyboard mechanism comprising a plurality of groups of keys any key of which is capable of initial operation, the several groups together representing a serial order, and locking means actuated by the operation of any key in any group to lock all the groups except the one next in the serial order.

8. The combination of a plurality of groups of keys and slides corresponding to and operated by the keys of each group, each slide having projecting means engaging with the keys of another group to control the operation thereof.

9. The combination of a plurality of groups of keys and slides corresponding to and operated by the keys of each group, each slide having projecting wings adapted to engage the keys of another group.

10. The combination of a plurality of groups of keys representing different denominations, the keys of the different groups be-

ing capable of operation in a predetermined order of sequence, and means controlled by the keys of each group to prevent simultaneous operation of keys of adjacent groups.

11. The combination of a plurality of groups of keys, slides operated by the respective groups, and a plurality of locking devices, each locking device engaged by one of said slides and controlled by the same, and each locking device having portions engaging the others of said slides to lock the same.

12. The combination of a plurality of groups of keys, slides operated by the respective groups, a plurality of locking devices each locking device having a portion engaged by one of the key-operated slides to control the operation of said locking device, a portion engaged by another of the key-operated slides to reset the locking device, and portions engaging other key-operated slides to lock the last-named slides.

13. A keyboard mechanism for the purposes described, comprising groups of keys and locking devices controlled by the keys of one group to lock all the other groups of keys except one, the keys of the unlocked group having connection with the locking devices whereby when one of said keys is actuated it will unlock the said locking devices.

14. A keyboard mechanism for the purposes described comprising groups of keys, locking devices controlled by the keys of one group to lock all the other groups of keys except one, means actuated by the keys of the unlocked group to release some of the locking devices, and independent means for releasing the other locking devices.

15. In a keyboard mechanism, a plurality of rows or groups of keys, interlocking mechanism cooperating with said rows or groups whereby an initial operation of a key in an intermediate row or group locks the keys of the row or group on one side thereof and leaves unlocked the keys of the adjacent group on the opposite side thereof.

16. In a keyboard mechanism, a plurality of groups of keys, the keys of any one of which are capable of initial operation, and mechanism cooperating with said groups whereby the operation of a key in one group leaves unlocked the keys of an adjacent group and the operation of a key in such adjacent group locks the keys in the first-mentioned group.

17. A keyboard mechanism for the purposes described comprising groups of keys representing different denominations, the keys of different groups being capable of operation in a predetermined order of sequence, means actuated by any key of one group to lock the keys of groups out of said predetermined order of sequence, and a locking device for all the keys and means for releasing said locking device.

18. A keyboard mechanism comprising a plurality of groups of keys, each group representing a member of a serial order and any key in any group being capable of initial operation, in combination with locking means operative by the actuation of any key in any group to lock all the other groups except one, and a universal locking device to lock all the keys, and means for releasing said locking device. 15
19. A keyboard mechanism comprising a plurality of groups of keys any key of which is capable of initial operation, the several groups together representing a serial order, and locking means actuated by the operation of any key in any group to lock all the groups except the one next in the serial order, and a universal locking device to lock all the keys and means for releasing said locking device. 15
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