May 15, 1928. 1,669,996

W. NAUMANN

CASH REGISTER

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Fig. 1

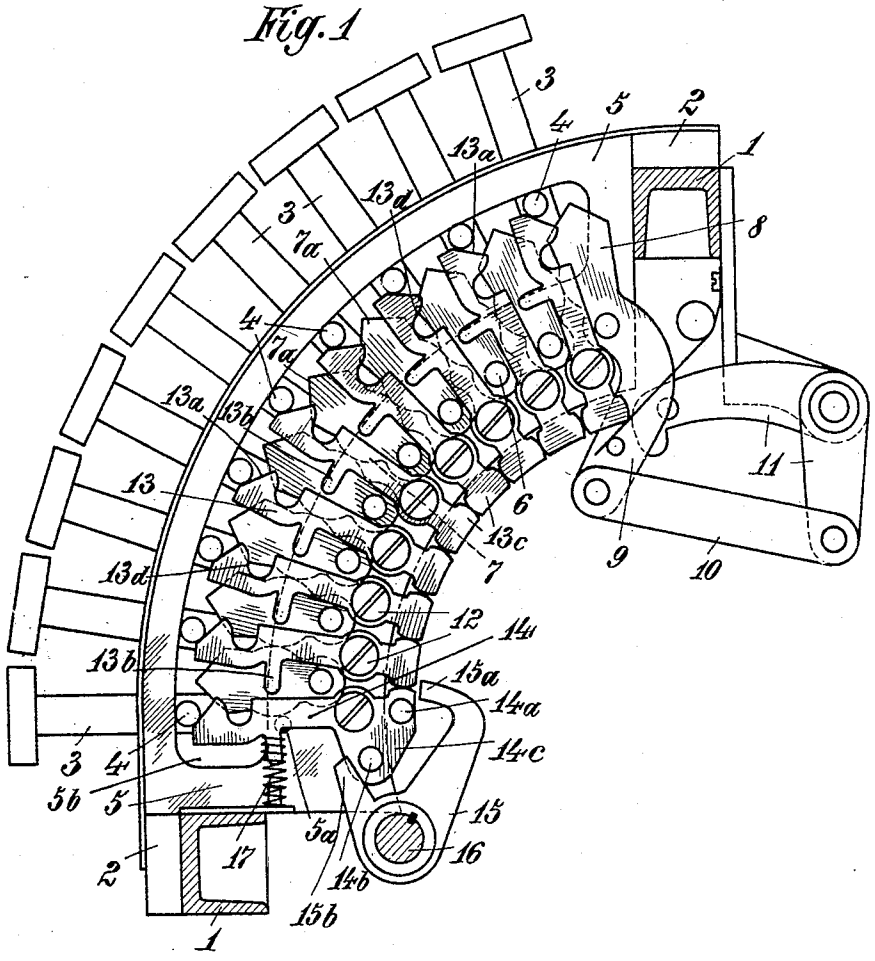

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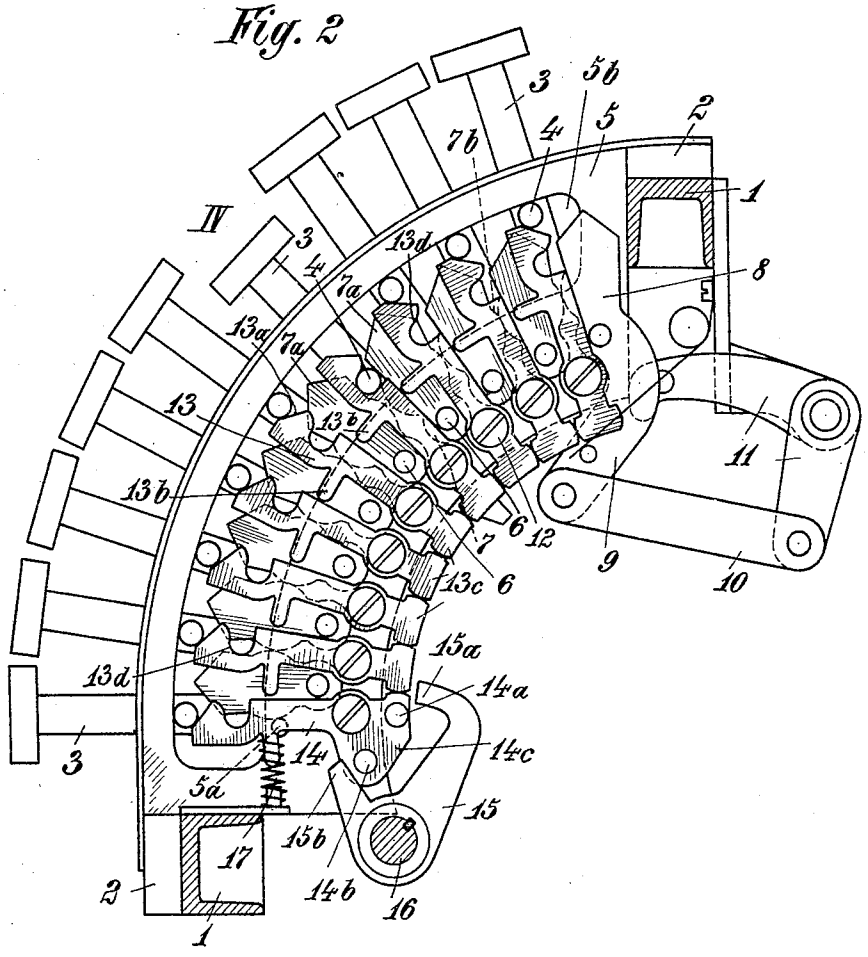
Fig. 2



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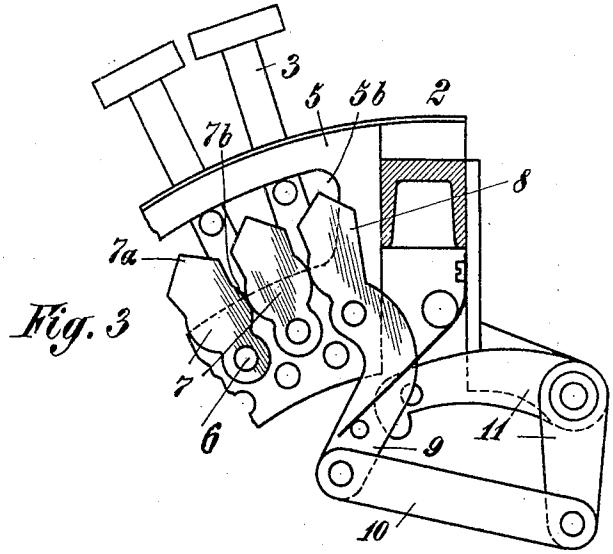
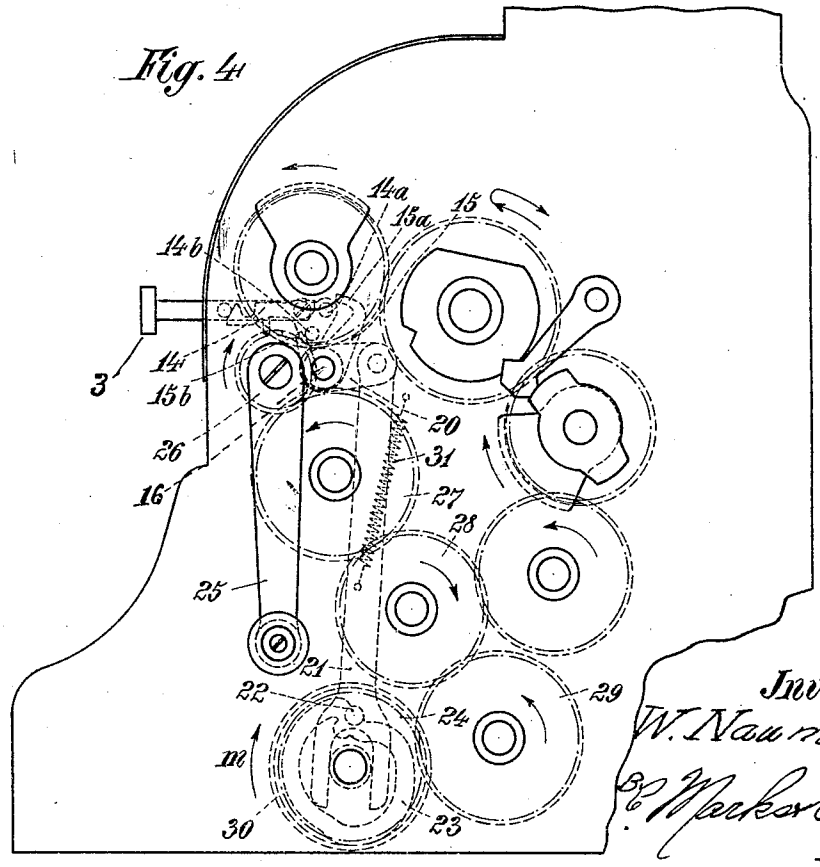


Fig. 3

Fig. 4



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UNITED STATES PATENT OFFICE.

WILLI NAUMANN, OF BIELEFELD, GERMANY.

CASH REGISTER.

Application filed January 15, 1923, Serial No. 612,863, and in Germany May 27, 1922.

My invention relates to improvements in cash registers and similar apparatus comprising keys for entering the values into the machine before operating the crank for transmitting the set values to the registering mechanism. One of the objects of the improvements is to provide a machine of this type in which a key struck in one column is released by striking another key of the same column before operating the machine and in which two or more keys can not simultaneously be depressed. With this and other objects in view my invention consists in the matters to be described hereinafter and particularly pointed out in the appended claims. For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawings in which the same reference characters have been used in all the views to indicate corresponding parts. In said drawings,

Fig. 1, is a cross-section of the machine showing the keys and the locking mechanism therefor,

Fig. 2, is a similar view with one of the keys depressed and prior to operating the machine crank,

Figure 3 is a view of the upper part of the key-board and the key-locking mechanism, with one set of locking members removed for showing the set of locking members located behind the same.

Fig. 4, is an end elevation of the machine showing the crank mechanism.

In the example shown in the figures the machine consists of a casing having its side walls connected by longitudinal bars 1 having arc-shaped key guiding members 2 secured thereto. Between adjacent guiding members stems 3 carrying keys are guided, which stems are provided with laterally projecting pins 4. To the members 2 segmental plates 5 are secured which are formed each with a segmental aperture 5^b for the passage of the pins 4 therethrough. On the said plates key locking members for preventing simultaneous operation of a plurality of keys are mounted, and as shown such locking members are in the form of levers 7 rockingly mounted on bolts 6 secured to the plates and having roof shaped ends 7^a and enlarged portions 7^b at parts intermediate their ends, which enlarged portions are such, that adjacent levers are in contact with each other. The lever which has received the reference character 8 (see Fig. 3) is made integral with an arm 9 connected by a link 10 with a bell crank lever 11 adapted to lock the operating mechanism of the cash register. The lowermost one of the levers 7 is supported on a pin 5^a fixed to the plate 5, and the mechanism connected with the lever 8 is constructed so that only one key 3 can be depressed at a time with its pin 4 into position between adjacent levers 7.

On pivot bolts 12 locking members or levers 13 one for each of the keys are mounted laterally of the plates 7. The outer ends of the said levers are formed with beveled faces 13^a located in position for being acted upon by the pin 4 before the said pin engages the roof-shaped ends 7^a of the levers 7, and below the said beveled faces the members are formed with cut-out portions 13^d adapted for locking engagement with the pins 4. At the side opposite to the cut-out portions 13^d the members 13 carry fingers 13^b located in position for engagement each with the adjacent member 13. The levers are formed with arms 13^c projecting from the bolts 12 inwardly and constructed with rounded enlarged portions, adjacent enlarged portions being in contact with each other. The lowermost one of the locking levers, which has been indicated by the reference characters 14, is provided with an enlarged rear extension 14^c carrying two pins 14^a and 14^b adapted for cooperation with the arms 15^a and 15^b of a bell crank lever 15 secured to a rock shaft 16 connected with the operating mechanism of the cash register. The lever 14 is acted upon by a spring 17 tending to push all the levers 13 and 14 upwardly and into the position shown in Figs. 1 and 2.

Fig. 4 shows by way of example operating mechanism for the member 15. As shown the said member is connected by an arm 20 with a link 21 carrying a pin 22 engaging in a cam groove 23 of a disk 24. The said disk is connected with the machine crank 25 by gear wheels 26, 27, 28, 29, and 30. A spring 31 tends to pull the link 21 upwardly.

The operation of the mechanism is as follows: By depressing for example the key IV the pin 4 of its stem slides over the beveled face 13^a of the corresponding locking lever 13 and rocks the same downwardly. Such rocking movement is transmitted by the fingers 13^b and the extensions 13^c to the other rocking levers 13 and 14. When the pin 4 is in position for engagement with the

cut-out portion 13^d the whole set of locking levers is forced upwardly by the spring 17, so that the depressed key is locked by its locking lever the cut-out portion 13^d of which engages the pin 4, as is clearly shown in Fig. 2. In the meantime the pin 4 has engaged the beveled face 7^a of the rocker 7 located above the same, and it has rocked the said rocker upwardly. Such rocking movement is transmited to all the rockers 7 located above the rocker acted upon by the pin 4 and also to the rocker 8, which therefore throws the bell crank lever 11 out of locking engagement with the operating mechanism of the machine. The rockers 7 located below the depressed key are not acted upon, because they are held in position by the pin 5^a secured to the plate 5 and supporting the lowermost one of the rockers 7. If now the machine crank is operated, the cam disk 24 is rotated in the direction of the arrow *m* shown in Fig. 4. Thereby the cam 23 permits upward movement of the link 21 by the spring 31, whereby the shaft 16 is rocked a little counterclockwise and with the arm 15^a into position above the pin 14^a. Thereby all the rockers 13 and 14 are locked with the pin 4 of the depressed key in locked position, because an outward movement of the depressed stem 3 can take place only by rocking the corresponding lever 13 downwardly. Therefore the depressed key can not be released after the operation of the machine has been started. Slightly before the end of the operation of the machine the cam groove 23 retracts the link 21 into initial position shown in Fig. 4, and the shaft 16 and the bell crank lever 15 are rocked clockwise. Thereby at first the levers 13 are released by the arm 15^a and thereafter they are rocked with their outer ends downwardly by the arm 15^b striking against the arm 14^b. Thereby the pin 4 of the depressed key is released, so that the key is thrown outwardly by its spring.

If a wrong key has been depressed, and if before operating the machine the correct key is depressed, the pin 4 of the latter rocks all the levers 13 downwardly, so that the key which has been erroneously depressed is released and thrown into normal position, the rocking movement caused by the depression of the correct key being transmitted by the fingers 13^c and the enlarged portions 13^b to the whole set of rockers 13. When depressing the correct key its pin 4 engages at first the beveled end face 13^a of its locking lever 13 and thereafter the roof-shaped ends 7^a of the levers 7. Therefore the said locking lever is first rocked in counter-clockwise direction and rocks the whole set of locking levers including the one cooperating with the erroneously depressed key, which is therefore released and returned into non-depressed position, before the pin 4 of the correct key engages the roof-shaped ends 7^a and passes between the levers 7.

If two or more keys are simultaneously struck the corresponding pins 4 slide on the beveled end faces 13^a, but they are arrested before arriving into positions for being locked by the levers 13 by their pins 4 engaging the beveled end faces 7^a of two levers 7 and tending to rock the same upwardly. Since the said levers 7 permit the passage of one pin 4 only the pairs of levers engaged by two pins 4 are not spread apart sufficiently to permit inward movement of the keys.

While in describing the invention reference has been made to a particular example embodying the same I wish it to be understood that my invention is not limited to the construction shown in the drawings, and that various changes may be made in the general arrangement of the apparatus and the construction of its parts without departing from the invention.

I claim:

1. In a keyboard mechanism, the combination, with a column of setting keys, of locking members one for each of said keys adapted to lock said keys in depressed positions, said locking members cooperating with each other so that when depressing any one of said keys all the members are temporarily moved into non-locking positions, operating means, and a bell crank lever operatively connected with said operating means and having two arms adapted for engagement, respectively at the beginning and near the end of the operation of said operating means, with said locking members for latching the same and throwing the same out of locking positions.

2. In a keyboard mechanism, the combination, with a column of setting keys, of locking members one for each of said keys adapted to lock said keys in depressed positions, said locking members being in the form of levers rockingly supported on parallel bolts and each formed at one side with a finger bearing on the adjacent lever and at the sides of said bolts opposite to said fingers with rounded heads making contact with each other, operating means, and means operative respectively at the beginning and at the end of the operation of said operating means to latch said locking members and to throw the same out of locking positions.

3. In a keyboard mechanism, the combination, with a column of setting keys, operating means and locking means therefor, of a series of interengaging levers one for each key mounted on parallel pivot bolts and adapted to be rocked upon depression of any key to one side, means for limiting the rocking movement of said levers by said keys so as to permit only one key to pass be-

tween the same, the last one of the series of levers (looking in the direction of the movement thereof) being in engagement with said locking means for throwing the same out of locking position.

4. In a keyboard mechanism, the combination, with a column of depressible keys, of a series of key locking levers one for each of said keys having beveled shoulders in position for engagement with said keys and mounted on parallel pivot bolts in positions for being rocked by the keys engaging the beveled shoulders thereof, and cooperating with each other so that when depressing one of said keys all the levers are temporarily moved into non-locking positions, operating means, means connected with said operating means and adapted for engagement, at the beginning and near the end of the operation of said operating means, with said key locking levers respectively for latching the same and throwing the same out of locking positions, a series of interengaging members one for each of said keys having beveled shoulders in position for engagement with said keys and rockingly mounted on parallel pivot bolts in positions for being rocked by said keys engaging the beveled shoulders thereof, means for limiting the rocking movement of said members so as to permit only one key at a time to pass between the same, and locking means for said operating means controlled by said members, said beveled shoulders of said locking levers and members being positioned relatively to said keys so that the locking levers are engaged by the keys being depressed prior to said members.

5. In a keyboard mechanism, the combination, with a column of keys, of two series of rocking levers mounted on parallel pivot bolts and formed with beveled shoulders located in the paths of the keys, one of said series comprising levers one for each of said keys adapted for making contact with each other at their sides, means for limiting the rocking movement of said keys adapted for making contact with each other so as to permit only one of said keys to pass between the same, and the other one of said series comprising locking levers adapted for simultaneous rocking movement by each of said keys engaging the beveled shoulders thereof and each formed with a nose making contact with the adjacent locking lever and at the sides of their fulcrums opposite to the keys with enlarged rounded extensions in contact with one another, the relative positions of the beveled shoulders of the rocking levers of both series cooperating with the same key being such that the locking levers are rocked by the keys prior to said levers adapted for making contact with each other, and means common to all of said locking levers to throw the same out of locking positions.

In testimony whereof I hereunto affix my signature.

WILLI NAUMANN.