(No Model.) 4 Sheets—Sheet 1.

C. E. LORD.

CASH INDICATOR AND REGISTER.

No. 454,972. Patented June 30, 1891.

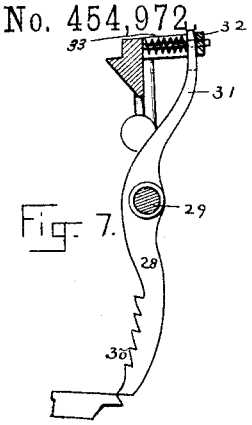

Fig. 7.

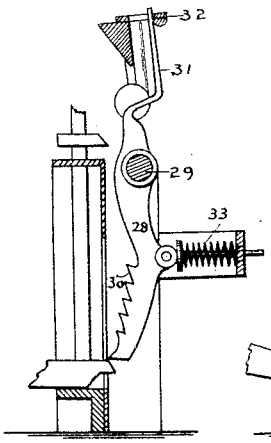

Fig. 8.

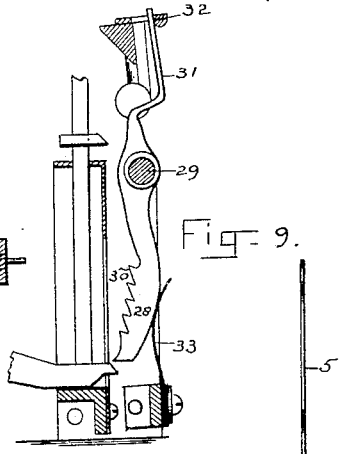

Fig. 9.

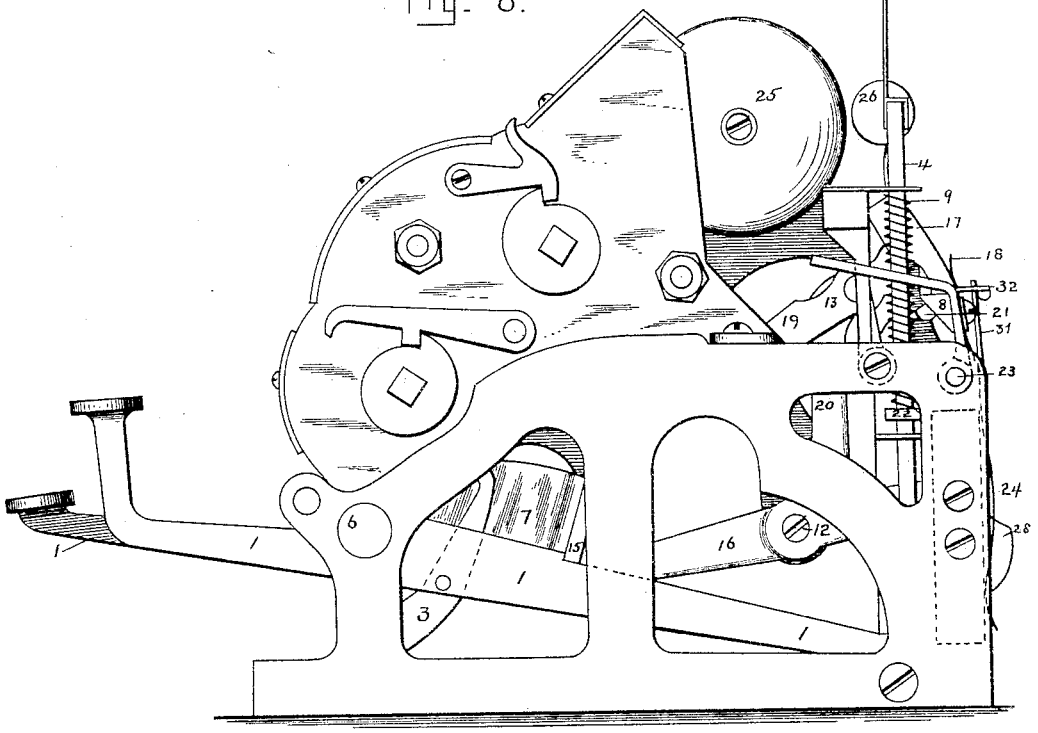

Fig. 1.

WITNESSES:

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(No Model.) 4 Sheets—Sheet 2.

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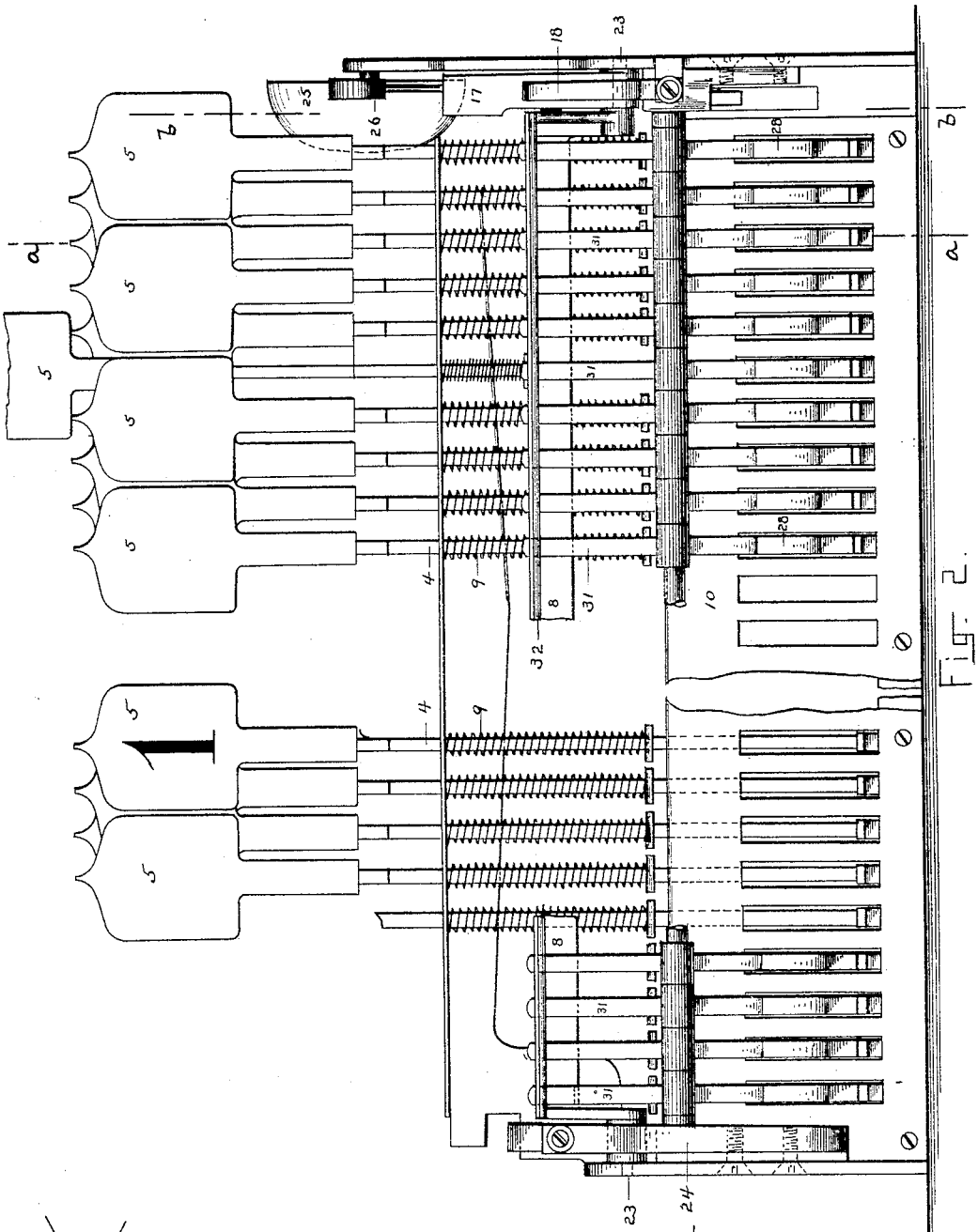

Fig. 2.

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(No Model.) 4 Sheets—Sheet 3.

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CASH INDICATOR AND REGISTER.

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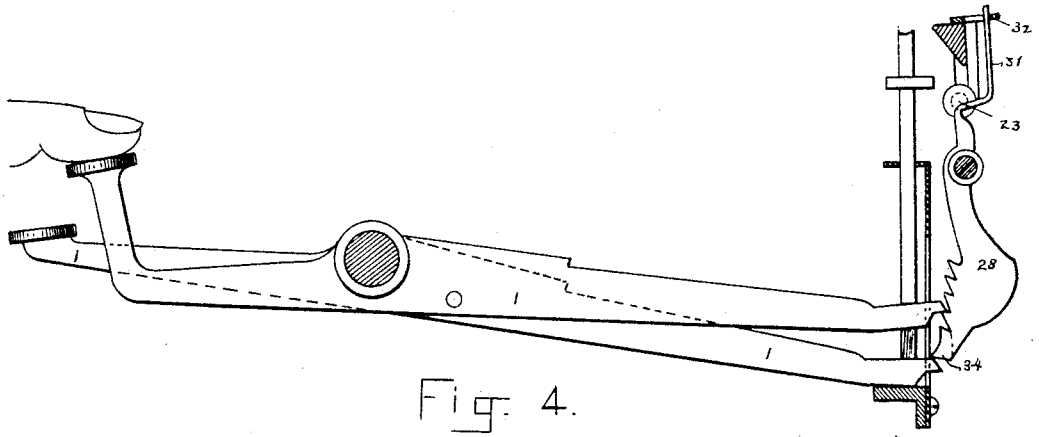

Fig. 4.

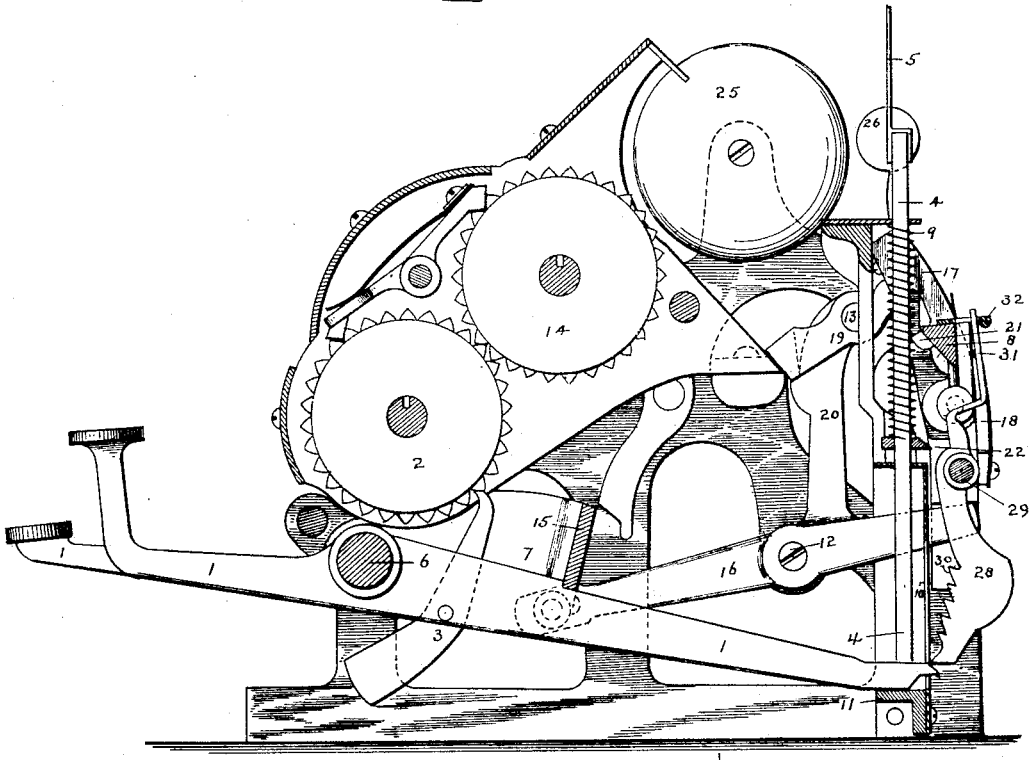

Fig. 3.

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(No Model.) 4 Sheets—Sheet 4.

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CASH INDICATOR AND REGISTER.

No. 454,972. Patented June 30, 1891.

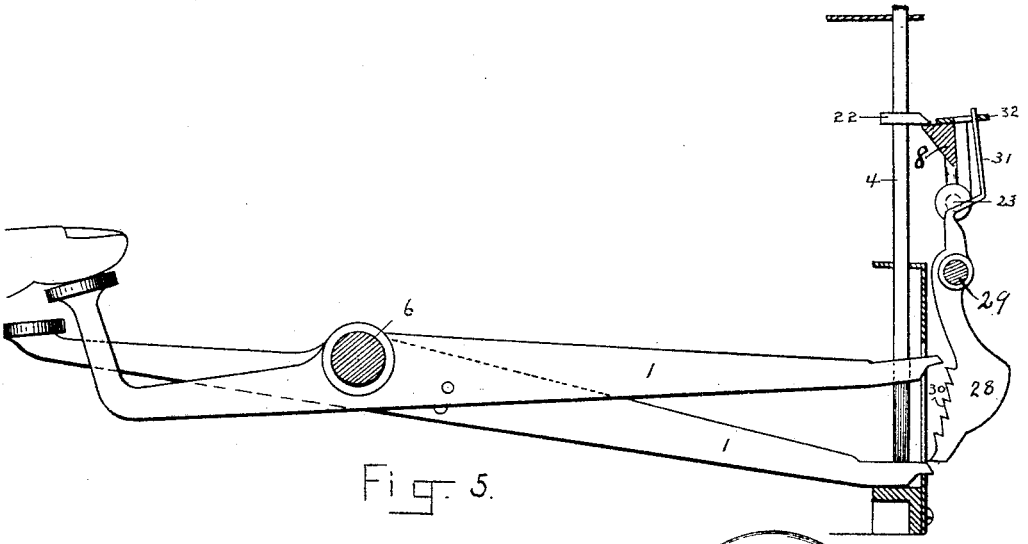

Fig. 5.

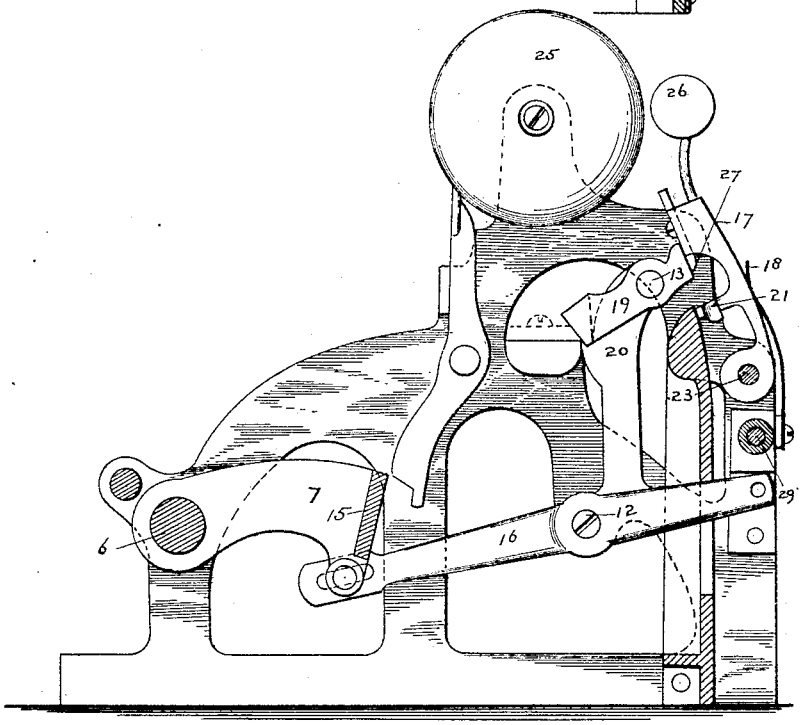

Fig. 6.

WITNESSES:
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William Claus

INVENTOR:
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UNITED STATES PATENT OFFICE.

CHARLES EDGAR LORD, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO.

CASH INDICATOR AND REGISTER.

SPECIFICATION forming part of Letters Patent No. 454,972, dated June 30, 1891.

Application filed August 3, 1888. Serial No. 281,878. (No model.)

To all whom it may concern:

Be it known that I, CHARLES EDGAR LORD, a citizen of the United States, residing at Boston, in the State of Massachusetts, have invented certain new and useful Improvements in Cash Registers and Indicators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My improvement relates to that class of cash registers and indicators which are provided with a registering mechanism actuated by a series of operating-keys, which usually co-operate with a series of indicating-tablets to both indicate and register the value of each key as it is operated. In such machines it is desirable, for reasons well known to those familiar with the use of the machines, to provide means for preventing the resetting of a key to its normal position after it has been partially operated but has not completed its stroke, and one feature of my invention relates to the provision of novel means for this purpose, while another feature relates to the provision of means for locking all the unoperated keys upon the partial operation of a key and holding them locked until such key has completed its stroke, all as will be hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is an end elevation of a cash-register, showing my improvements as applied to a well-known form of machine. Fig. 2 is a rear elevation of the same with portions of the machine broken away. Fig. 3 is a sectional side elevation taken through the line *a a* of Fig. 2, and looking toward the left-hand side of the machine. Fig. 4 is a detail view of two operating-keys, one of the key-locks, and adjacent parts of the machine. Fig. 5 is a view corresponding to Fig. 4, but with the parts in a different position. Fig. 6 is a sectional side elevation of a part of the machine, taken through the line *b b* of Fig. 2 and looking toward the left of the machine. Figs. 7, 8, and 9 are detail views of modified forms of key-locks with the adjacent parts of the machine.

The same letters of reference are used to indicate identical parts in all the figures.

Inasmuch as I have illustrated my improvements as applied to a well-known form of machine, the general construction of such machine may be briefly described as follows: The registering and indicating mechanisms are supported in a proper frame-work and are designed to be inclosed in the usual case or cabinet, (not shown,) through the front of which the front ends of the keys project and in the upper rear portion of which is a glass-covered reading-opening for the exposure of the indicating-tablets. The operating-keys 1 are pivoted on the shaft 6, extending across the front portion of the machine. Their front ends are provided with numbered finger-buttons, while their rear ends, resting in normal position on the cross-piece 11 of the frame-work, play up and down in slots in a guide-plate 10 and carry vertically-guided tablet-rods 4, provided at their upper ends with the numbered indicating-tablets 5 and surrounded by the usual coiled resetting springs 9. The tablet-rods are provided with shoulders 22, which are engaged by the pivoted wing 8, supported in bearings 23 and provided with an upward extension 17, carrying the gong-hammer 26, arranged to strike the gong 25 upon the actuation of the wing by the following means: Extending across and resting upon the keys in rear of their pivotal support is the cross-bar 15, hung by side arms 7 upon the shaft 6. Pivoted, as at 12, to the frame of the machine is a bell-crank arm, whose lower forwardly-extending portion 16 is connected by a slot and pin to the bar 15 or to one of its side arms 7, and whose upward and rearwardly extending portion 20 carries a weighted tripping-dog 19, pivoted as at 13, and whose rearwardly-extending nose engages a wiper-block 27 upon the upward extension 17 of the wing, as shown in Fig. 6. Springs 18 and 24 press the wing 8 and its extension 17 inward and yieldingly hold them in normal position. It results from this construction that when a front end of a key is depressed the cross-bar 15 will be lifted, the bell-crank arm rocked, and its upwardly-extending portion 20 thrown backward, the dog 19 will engage the wiper-block 27 on the extension 17 of the wing 8 and push said extension and wing backward against the resistance of their springs until the shoulder 22 of the operated tablet-rod having passed above

the wing the nose of the dog 19 slips past the wiper-block 27, the extension 17 and the wing 8 are released and thrown back to their normal position, the hammer 26 striking the gong 25 and the wing 8 engaging the shoulder of the elevated tablet-rod to hold its tablet exposed to view, all in the usual manner and as will be readily understood. When the operated key is released, it resets itself, the bar 15 and bell-crank arm resume their normal position, and the nose of the dog 19 flips back over the wiper-block 27 ready for another operation. The registering mechanism in this instance consists of two banks of individual registering-wheels 2 and 14, the wheels of the lower bank being engaged by actuating-dogs 3, pivoted to the keys 1, each arranged to turn its corresponding wheel one number upon each full operation of its key. The wheels of the upper bank are each turned one number at each complete revolution of its corresponding wheel in the lower bank in the usual manner.

As a means of preventing the resetting of a key to normal position after it has been partially but not fully operated, I provide an automatically-operated key-arrester for each key, so arranged that when the key is partially operated it will engage and support the key in its partially-operated position, should it be released before it has been fully operated, and upon the full operation of the key it will be automatically disengaged therefrom to permit the key to be reset to its normal position, and for the further purpose of preventing the operation of a second key after a first has been partially but not fully operated I so construct and arrange these key-arresters that when one key is partially operated its arrester will move into engagement with it to prevent its being reset until fully operated, while the key-arresters of all the unoperated keys will so engage their respective keys as to prevent the operation of any of them until released by the full operation of the first-operated key. In this manner the same set of devices are made to act both as key-arresters to prevent the resetting of a partially-operated key and as key-locks to lock the unoperated keys from operation.

As illustrated in the accompanying drawings, these key arresting and locking devices consist of pendent metal arms 28, having serrations 30 on their inner sides and pivoted on a shaft 29, extending across the frame of the machine above and slightly in rear of the rear ends of the keys. They are arranged one in line with each key, their inner lower edges hanging normally just above the horizontal line of the upper sides of the rear ends of the keys and either slightly in rear of the vertical line of their ends or vertically above the extreme tips of their ends when beveled, as shown in the drawings. When constructed and arranged as shown in Figs. 3, 4, and 5 they assume this normal position by their own gravity, being so shaped and pivoted that unless prevented they will by their own gravity swing inward and rest over the rear ends of the keys. They are prevented from normally assuming this extreme inward position by a horizontal bar 32, which extends across and bears against the rear sides of their upper extensions 31, above the pivotal shaft 29. This bar 32 holds these upper ends tilted slightly inward and the lower ends of the arms 28 slightly outward from the position their gravity would otherwise cause them to assume, as shown in Fig. 3, and maintains them in this normal position, except when a key is operated, at which time the bar 32, in the manner hereinafter described, is moved slightly rearward, and the arms 28 are thereby permitted to swing inward to the position their gravity causes them to assume over the ends of the unoperated keys, as shown in Fig. 4. The bar 32, which I call the "resetting-bar," may be supported and actuated in any suitable manner to reset the key-arresters and yieldingly hold them in their normal position. In the present instance, owing to the construction and mode of operation of the particular machine to which I have illustrated my invention as being applied, I find it convenient to secure it to the tablet-supporting wing 8, so that it is moved back and forth by the actuation of said wing, the upper extensions 31 of the arms 28 extending through and having limited play in the open space between the bar and the rear side of the wing. The rear ends of the keys are preferably cut away and beveled to a point, as shown, to facilitate their engagement with the serrations 30 on the inner sides of the arms 28.

It results from this construction and arrangement that, assuming the machine to be in the position of rest shown in Fig. 3, if the front end of a key is depressed the operation of the parts will be as follows: The rear end of the key in rising will pass above the lower inner edge of its corresponding arm 28, either clearing the same or by its beveled end pushing said arm backward slightly until it passes. At the same time the cross-bar 15 is lifted by the rising of the key, the arm 20 of the bell-crank thrown backward, its dog 19 engages the wiper-block 27 on the wing-extension 17, and the wing 8 is moved backward, carrying with it the bar 32, and allowing the arms 28 to swing inward by their own gravity, the serrations of the one corresponding to the operated key engaging the rear end of that key, and the lower ends of all the others assuming a position immediately over the rear ends of their corresponding keys, thereby effectually locking the latter from operation. This position of the parts is shown in Fig. 4, where the arms 28 are all in exact line with each other, so that only the nearest one is shown, and that is engaged by its serrations with the partially-operated key. As this key continues to rise, its rear end slips over the serrations in the arm 28, and if released at any point

before full operation it will be engaged and supported at that point by said serrations. Upon reaching its full operation, however, the dog 19 on the arm 20 of the bell-crank will have slipped past the wiper-block 27 on the wing extension 27 and the wing will be reset, engaging the shoulder of the elevated tablet-rod and causing the hammer 26 to strike the gong 25. The bar 32, moving inward and being reset with the wing, comes into engagement with the upper extensions 31 of the arms 28 and throws all of the latter back to the position shown in Fig. 3, thereby releasing the operated key and unlocking all the unoperated ones. While it is desirable to so construct and arrange the arms 28 that they will act both as key-arresters for partially-operated keys and as key-locks for the unoperated keys, yet these two functions of the arms are distinct, and they may be advantageously employed for either purpose independently of the other. Thus the serrations might be left off the inner sides of the arms, so that they would act only as locks for the unoperated keys, or when the arms are serrated to act as arresters for partially-operated keys, their lower ends might be so beveled or rounded as not to act as locks, as shown, for instance, by the dotted line 34 in Fig. 4. Again, instead of so shaping and pivoting the arms 28, that they tend to swing in over the rear ends of the keys by their own gravity, springs 33 may be employed for pushing them inward, as shown in Figs. 7, 8, and 9.

Inasmuch as the registering and indicating mechanisms of machines of this class are usually inclosed in a locked case or cabinet, from which project only the front ends of the keys bearing the numbered finger-buttons, it results from the above-described construction and operation of my improvements that when any key is partially operated it is not only impossible to reset it without first operating it to its full extent, but until it is so operated all the other keys, and thereby the entire machine, are locked from operation.

I wish it understood that the machine I have shown and described has been selected by me for this purpose merely because it is of a well-known type and affords a convenient means of showing the application of my improvements, and such being the case the means which I have illustrated for actuating the key arresting and locking devices are only incidental to the particular construction of this machine, and such other suitable means may be employed for this purpose as may be found convenient in the different machines to which my improvement may be applied. Nor do I wish to be limited to the particular form or arrangement of the key-arresting and locking devices, for they may be largely varied without changing the general mode of operation of said devices or the results accomplished thereby.

While I have shown my improvements as applied to a machine whose registering mechanism consists of a series of individual registering-wheels, one for each key, and each arranged to be turned one number by a full operation of its key, they may be employed to perhaps even greater advantage in machines having a registering-wheel common to and actuated by each of a series of keys, for in such machines the wheel is actuated to different degrees by keys of different values, and it is absolutely essential to an accurate registration that each key be operated to its full extent before being reset.

I am aware that it is not entirely new in cash registers and indicators to employ key-arresting devices for preventing the resetting of a partially-operated key, but those heretofore in use have been radically different from mine both in construction and mode of operation, and so far as the key-locking feature of my invention is concerned, I believe I am the first to produce a locking device operating, as mine does, upon the partial operation of a key to engage all the unoperated keys and lock them from operation until the first-mentioned key has been fully operated, and to thereupon unlock and release said keys.

One form of key-arrester heretofore in use consisted of a laterally-movable grid of vertical rack-bars supported at the rear of the machine, through which grid the rear ends of the keys projected, and which moved sidewise upon the lifting of the rear end of a key, so that one of its rack-bars engaged the side of the key and supported it in partially-operated position, if released; but the key-arrester I have shown and described, which is pivoted on an axis transversely of the keys and moves longitudinally thereof, is simpler and more efficient than that above referred to.

In another pending application, filed May 7, 1889, Serial No. 309,888, I have illustrated and described a different embodiment of my invention, in which is employed a horizontal key-arresting and key-locking bar of substantially the same shape in cross-section as the key-locks and key-arresters of my present application, and arranged to operate in a similar manner.

Having thus fully described my invention, I claim—

1. In a cash register and indicator, the combination, with the operating-keys, of a key-lock arranged upon the partial operation of a key to lock the unoperated keys and hold them from operation until the partially-operated key has completed its stroke and to then unlock and release said keys, substantially as and for the purpose described.

2. In a cash register and indicator, the combination, with the operating-keys, of a key-lock pivoted near the rear ends of the keys and arranged when a key is partially operated to lock the unoperated keys and hold them from operation until the partially-oper-

ated key has completed its stroke and to then unlock and release said keys, substantially as and for the purpose described.

3. In a cash register and indicator, the combination, with a series of pivoted operating-keys, of a key-lock arranged upon the partial operation of a key to lock the unoperated keys and prevent their operation until after the partially-operated key has completed its stroke and to then unlock and release said keys, substantially as and for the purpose described.

4. In a cash register and indicator, the combination, with a series of pivoted operating-keys, of a key-lock pivoted at the rear of the machine and arranged when a key is partially operated to move into engagement with and lock the unoperated keys and after the full operation of the key to unlock and release said unoperated keys, substantially as and for the purpose described.

5. In a cash register and indicator, the combination, with the operating-keys, of a key-lock which permits the simultaneous operation of two or more keys, but arranged upon the partial operation of a key to lock the unoperated keys and hold them from operation until the partially-operated key has completed its stroke and to then unlock and release said keys, substantially as and for the purpose described.

6. In a cash register and indicator, the combination, with a series of pivoted operating-keys, of a key-lock which permits the simultaneous operation of two or more keys, but arranged upon the partial operation of a key to lock the unoperated keys and hold them from operation until the partially-operated key has completed its stroke, substantially as and for the purpose described.

7. In a cash register and indicator, the combination, with the operating-keys, of a series of key-locks, one for each key, and arranged when a key is partially operated to lock the unoperated keys until the partially-operated key has completed its stroke and to then unlock and release said keys, substantially as and for the purpose described.

8. In a cash register and indicator, the combination, with the operating-keys, of a series of key-locks, one for each key, pivoted at the rear of the machine and arranged when a key is partially operated to move over the rear ends of the unoperated keys and lock them from operation until the partially-operated key has completed its stroke and to then unlock and release said keys, substantially as and for the purpose described.

9. In a cash register and indicator, the combination, with a series of pivoted operating-keys, of a series of key-locks pivoted on a shaft at the rear of the machine and arranged when a key is partially operated to move over the ends of the unoperated keys and lock them from operation until the partially-operated key has completed its stroke and to then unlock and release said keys, substantially as and for the purpose described.

10. In a cash register and indicator, the combination, with the operating-keys, of the arms 28, pivoted at the rear of the machine on an axis extending transversely of the keys and arranged when a key is partially operated to swing inward over the ends of the unoperated keys to lock the same from operation and after the full operation of such key to be moved back to their normal position to release the unoperated keys, substantially as and for the purpose described.

11. In a cash register and indicator, the combination, with an operating-key, of a key-arresting arm pivoted near the rear end of said key and arranged when the key is partially operated to swing inward longitudinally of said key toward its rear end and engage therewith to support the key in its partially-operated position, if released, and to be disengaged therefrom when the key has been fully operated, substantially as and for the purpose described.

12. In a cash register and indicator, the combination, with an operating-key, of a key-arresting arm pivoted near the rear end of the key on an axis extending transversely thereof and provided on its inner face with serrations, and arranged when the key is partially operated to swing inward toward its rear end and engage the serrations therewith to support the key in its partially-operated position, if released, and upon the full operation of the key to move out of engagement therewith to permit it to be reset, substantially as and for the purpose described.

13. In a cash register and indicator, the combination, with an operating-key, of a key-arresting arm pivoted near the rear end of said key on an axis extending transversely thereof and arranged when free to swing on its pivot to move inward over the end of said key, a device for holding it normally outward from over the key, and means for releasing it upon the partial operation of the key to permit it to swing inward and engage the key, substantially as and for the purpose described.

14. In a cash register and indicator the combination, with the operating-keys, of a series of arms, one for each key, pivoted at the rear of the machine and arranged, when free, to swing on their pivots to move inward over the rear ends of the keys, a bar for normally holding them outward from over the keys, and means for moving said bar upon the partial operation of a key to permit the arms to swing inward over the ends of the keys, substantially as and for the purpose described.

15. In a cash register and indicator, the combination, with the operating-keys, of the arms 28, pivoted at the rear side of the machine in line with said keys and arranged to swing inward over their rear ends, the bar 32 for holding said arms outward in normal position, and mechanism interposed between

said bar and the operating-keys, whereby upon partially operating a key the bar 32 is moved to permit the arms 28 to swing inward over the ends of the keys and upon fully operating said key the bar 32 is moved back to return arms 28 to their normal position, substantially as and for the purpose described.

16. In a cash-register, the combination, with a series of movable registering-keys, of a series of movable key-locks adapted to automatically move into locking position when allowed to do so, and one of which works in connection with each of said keys to lock and release the same, and a key-lock setter normally holding said key-locks out of their locking position, actuated by a connection with each of said keys, and adapted, when any key of the set has been substantially displaced from its normal position, to allow said key-locks to move into their locking position and thereby lock all unused keys of the set, substantially as described, and for the purpose set forth.

17. In a cash-register, the combination, with a movable registering-key, of a serrated key-lock which works in connection with said registering-key and with no other and allowing said key to move forward in its course, but preventing its backward motion until its forward motion has been completed, and a key-lock setter actuated by a connection with said key and adapted to move said key-lock and thereby allow said key to move back to its primary position when its forward motion has been completed, substantially as described, and for the purposes specified.

18. In a cash-register, the combination, with a series of pivoted registering-keys, of a series of serrated key-locks, each adapted to move into position to lock said keys when allowed to do so, a key-lock of said series engaging with each of said registering-keys and with no other key and adapted to lock and release the same and to cause it to fully complete its forward motion when once begun, and a key-lock setter normally holding said key-locks out of their locking position and actuated by a connection with each of said registering-keys and adapted, when any key of the set has been substantially displaced from its normal position, to allow said key-locks to lock all unused keys of the set, substantially as described, and for the purposes specified.

19. In a cash-register, the combination, with a series of registering-keys and a series of registering-wheels actuated thereby, of a series of movable key-locks, one key-lock working in connection with each of said keys and with no other, a key-board extending across said set of keys, a key-lock setter, and a key-lock connection actuating said key-lock setter from said key-board, said key-lock setter being adapted to allow said key-locks to lock all unused keys of the set as soon as any key has been displaced from its normal position, and to force said key-locks out of their locking position upon the completion of the forward motion of said moving key, substantially as described, and for the purposes specified.

20. The rocking key-lock having the locking serrations, and the handle adapted to engage with a key-lock setter, substantially as described, and for the purposes specified.

21. The rocking key-lock having the locking-point, the locking-serrations, and the handle adapted to engage with a key-lock setter, substantially as described, and for the purposes specified.

22. In a cash register and indicator, the combination, with an operating-key, of a key-arrester supported at the rear of the machine and arranged when the key is partially operated to move inward longitudinally of the key toward its rear end and engage therewith to support it in its partially-operated position, if released, and to be disengaged therefrom when the key has been fully operated, substantially as and for the purpose specified.

23. In a cash register and indicator, the combination, with an operating-key, of a key-arrester pivoted on an axis extending transversely of the key and arranged when the key is partially operated to engage the same and support it in its partially operated position, if released, substantially as and for the purpose described.

24. In a cash register and indicator, the combination, with an operating-key, of a key-arrester supported on a pivot transversely of the key and arranged, when the key is partially operated, to engage the same to support it in its partially-operated position, if released, and to be disengaged therefrom when the key has been fully operated, substantially as and for the purpose specified.

CHARLES EDGAR LORD.

Witnesses:
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C. H. FISHER.