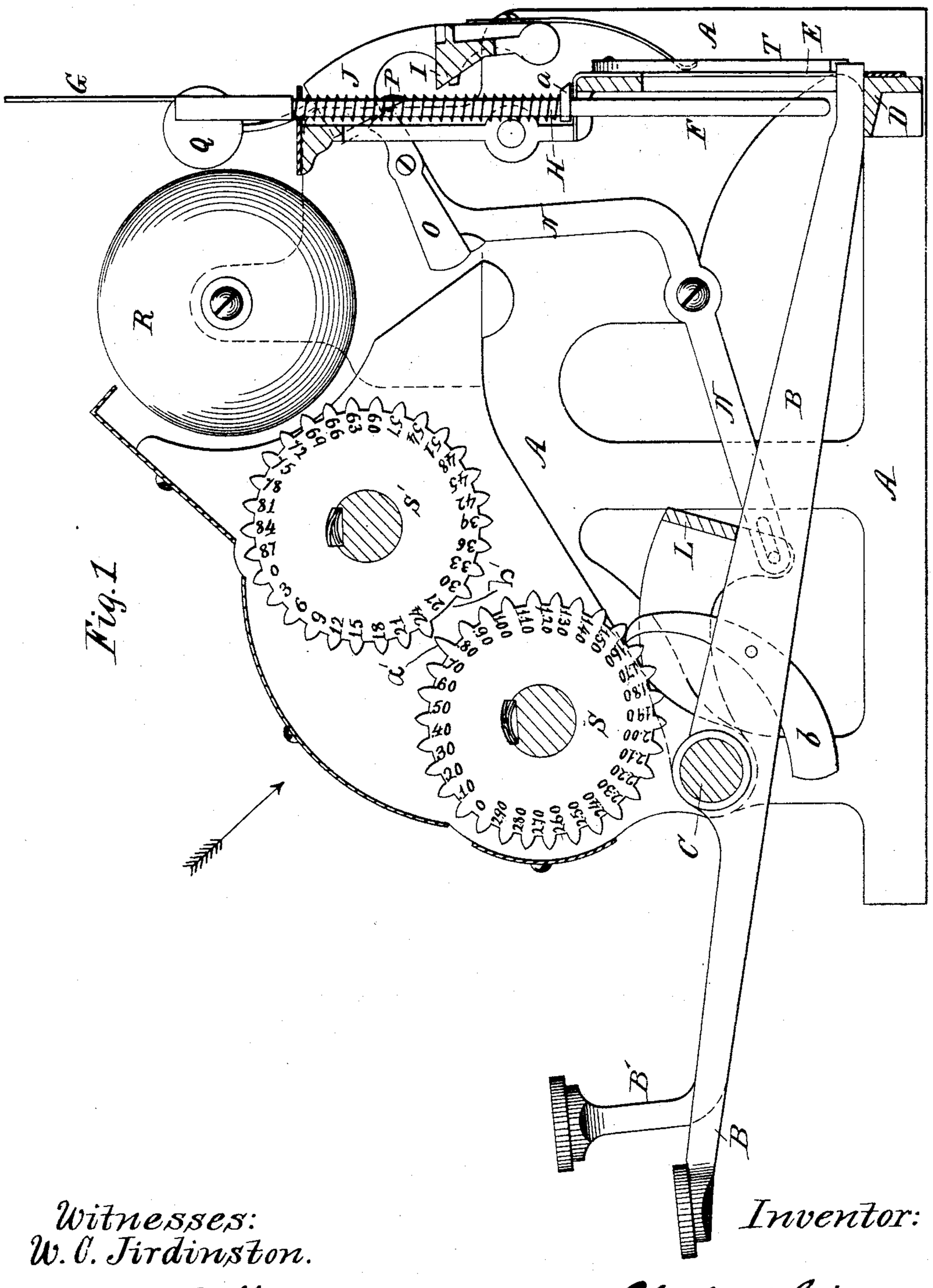
(No Model.) 2 Sheets—Sheet 1.

C. D. GRIMES.

CASH REGISTER AND INDICATOR.

No. 436,579. Patented Sept. 16, 1890.



Witnesses:
W. C. Jirdinston.
Charles Billon

Inventor:
Charles D. Grimes
by Peck & Reeton
his Attorneys.

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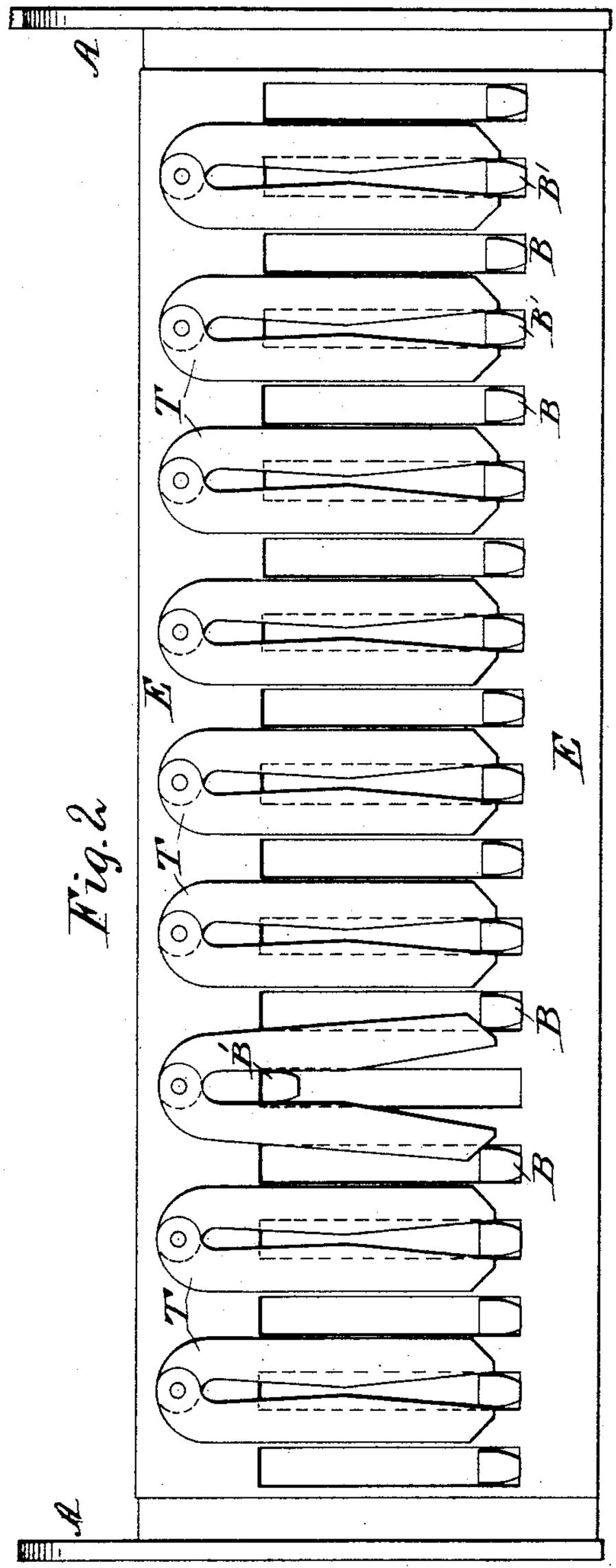

Fig. 2.

Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES D. GRIMES, OF DAYTON, OHIO, ASSIGNOR TO THE NATIONAL CASH REGISTER COMPANY, OF SAME PLACE.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 436,579, dated September 16, 1890.

Application filed May 7, 1889. Serial No. 309,882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. GRIMES, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, 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, forming part of this specification.

One feature of my invention relates to that class of cash registers and indicators which employ one or more sets of registering-wheels, in which the first wheel of the set adds on to the second wheel thereof by being arranged to turn the latter one notch or number at each complete revolution of the former. In such machines the total amounts registered on the first wheel will continue to be transferred to the second wheel until the latter has made one complete revolution and arrived at its starting-point. If it be turned any farther, its registrations will begin again at zero, and where there are only two wheels in each set the total registration of its first revolution will be lost. This feature of my invention relates to such a construction and arrangement of these wheels relatively to each other that while the second wheel will be turned one number at each complete revolution of the first wheel until the second wheel has itself made one revolution, it will then be freed from the first wheel and remain stationary with its highest registration indicated, no matter how many times more the first wheel is revolved.

Another feature of my invention relates more particularly to that class of cash registers and indicators which employ a series of pivoted operating-keys having their front or operating ends arranged in two banks, one above the other, and provided with numbered finger-buttons. In such machines, in rapidly or carelessly operating a key of the upper bank the operator will sometimes permit his fingers to slip off the finger-button and strike the button of one of the adjacent keys in the lower bank, thereby depressing the latter and causing it to actuate its registering-wheel and make a false registration. To guard against such accidents I have provided novel means for locking the two subjacent keys in the lower bank whenever a key in the upper bank is operated and holding them locked until the operated key is reset to its normal position.

In the accompanying drawings, Figure 1 is a sectional side elevation of a well-known form of machine embodying my improvements. Fig. 2 is a rear elevation of the slotted guide-plate, the ends of the keys, and the hangers for locking the keys of the lower bank. Fig. 3 is a front view of the two registering-wheels shown in Fig. 1, looking in the direction of the arrow in that figure. Fig. 4 is a corresponding view of two similar wheels under a different arrangement relatively to each other.

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

The general construction of the machine to which I have illustrated my improvements as applied is well known to those familiar with the art, and may be thus briefly described. The registering and indicating mechanisms are supported in a frame-work A, and are designed to be inclosed in the usual case or cabinet, (not shown,) through the front side of which the front ends of the operating-keys B B′ project, and in the upper rear portion of which is a glass-covered reading-opening for the exposure of the indicating-tablets. The keys B B′ are pivoted on a shaft C, extending across the front of the machine. Their front ends are provided with numbered finger-buttons, and the ends of the alternate keys B′ are bent upward, as shown, to form two banks of buttons, one above the other, as is usual in this class of machines, to enable the keys to be arranged close together and at the same time afford room for the vertical play of the buttons. With the exception of this arrangement of their front ends, the keys of the two banks are just alike; but for convenience in describing the arrangement and operation of the locks for the keys of the lower bank I have distinguished them from each other by lettering the keys of the lower bank B and those of the upper bank B′. The rear ends of the keys, resting in normal position on the cross-piece D of the frame-work, play up and down in slots in a guide-plate E and carry vertically-guided tablet-rods F,

provided at their upper ends with numbered indicating-tablets G and surrounded by the usual coiled resetting-springs H. The tablet-rods are provided with shoulders *a*, which are engaged by the pivoted wing I, provided with an upward extension J and actuated upon the operation of any key, through the medium of the vibrating-bar L, bell-crank N, tripping-dog O, and wiper-block P, to engage the shoulder of the operated tablet-rod and cause the hammer Q, secured to the wing-extension J, to strike the gong R.

The registering mechanism of the machine which I have illustrated consists of two banks of individual registering-wheels S S′, arranged one above the other, the wheels of the lower bank being engaged by actuating-dogs *b*, pivoted to the keys B B′, and each arranged to turn its corresponding wheel one number upon the full operation of its key. The ratchet of each wheel S has thirty teeth, one of them *a*′ being longer than the others, to engage a tooth of the ratchet of the adjacent wheel S′ and turn the latter one number at each complete revolution of the wheel S.

Heretofore it has been the practice to provide the wheel S′ with a corresponding number of teeth, or at least with a series of equidistant teeth, so that it would continue to be turned one tooth or number at each revolution of the wheel S as long as the latter was revolved. Under this construction and arrangement when the wheel S had made thirty complete revolutions the wheel S′ (supposing the latter to be provided with thirty teeth) would have been turned one complete revolution and brought back to the starting-point. Now it will be evident that the total amount that can be registered on these two wheels will be that indicated when the wheel S′ has been turned one number less than a complete revolution and the wheel S has been turned one number less than thirty complete revolutions, at which time the highest amount on each of the two wheels will appear at their respective reading-openings. If the wheel S is then turned one tooth farther, a zero will appear at each reading-opening and all the registration will be lost.

In the practical use of these machines the readings are taken from the registering-wheels and the latter reset to zero at such frequent intervals, usually at the end of each day's business, that it is not supposed or intended that any one key shall have been operated often enough to cause its corresponding wheel S′ to have made a complete revolution. Thus in the machine illustrated each key would have to be operated nine hundred times in order to cause its wheel S′ to be turned one revolution, and as there is a separate key and separate set of wheels for each value to be registered no one key is likely to be used that often in a single day. But while this is true, the construction and arrangement of these wheels heretofore has enabled a dishonest attendant to falsify the registration and cheat the proprietor by operating a key a sufficient number of times to cause its wheel S′ to make a complete revolution and come back to its zero-point. For instance, suppose the ten-cent key has in the actual business of the day been operated three hundred and five times and a corresponding amount of cash received by the attendant. The number 30 will appear at the reading-opening of the wheel S′ and 50 at that of the wheel S, indicating a total registration of $30.50. Now if the attendant should operate this key six hundred times more a zero would appear at the reading-opening of the wheel S′ and 50 at that of the wheel S; or, if he should operate it seven hundred times instead of six hundred, the number 9 would appear at the reading-opening of the wheel S′ and $1.50 at that of the wheel S, indicating a total registration of $10.50, so that the attendant could account for this amount to the proprietor and himself retain the remaining $20 of the $30.50, which had been received and registered in the actual business of the day. I propose to remedy this defect by omitting one tooth from the ratchet of the wheel S′ and leaving a vacant space *b*′ in the place of said tooth, so that when the wheel has been turned until this space reaches the point for engagement with the large tooth of the wheel S the latter will move through said vacant space instead of striking a tooth and turning the wheel S′ one number. The tooth is omitted at such a point on the wheel S′ that the vacant space will reach the point for engagement with the large tooth of the wheel S at the same time the highest number on the wheel S′ appears through its reading-opening, and thus when the wheel S′ has reached this point it will not be affected by any further revolutions of the wheel S and its highest number will remain exposed through its reading-opening. Thus in the machine illustrated in the drawings the wheels corresponding to the ten-cent key are shown in the sectional view of Fig. 1, and the tooth is omitted from the wheel S′ at its number 27, while its number 87 is exposed at its reading-opening. The large tooth *a*′ on the wheel S is placed at such a point that it will engage the tooth of the wheel S′ and turn the latter just as the zero on the wheel S is brought under its reading-opening, as is usual in machines of this character.

In Fig. 4 I have shown a different arrangement of the wheels S and S′, in which their ratchets are not in line with each other, and the ratchet of the wheel S is not provided with the one tooth of extra size, but instead the face of the wheel has on it a separate tooth *a*′, arranged to engage the ratchet of the wheel S′ at each complete revolution of the wheel S.

The locking devices for the keys of the lower bank consist of pendent hangers or stops T, pivoted to the rear side of the slotted guide-plate E, two of them above and straddling the end of each of the keys B′ of the upper bank.

They are so shaped and pivoted that when the keys B′ are at rest the lower ends of the hangers of each set bear against the sides of its key B′, and when the latter rises in operation it spreads its hangers apart and causes one to move over and lock each of the adjacent keys B of the lower bank, as shown in Fig. 2. In this manner when any key of the upper bank is either partially or fully operated the two adjacent keys of the lower bank are locked from operation until the operated key has been reset.

I am aware that a series of pendent hangers or stops pivoted above the rear ends of the keys and arranged to prevent the simultaneous operation of two or more keys, but permitting the operation of a single key, are old and well known in machines of this character; but in machines having a registering mechanism similar to that illustrated in this case it is often desirable to operate two keys at once to register a sale whose value does not correspond to that of any single key. It will be noticed that my present invention permits the simultaneous operation of two or more or even all of the keys of the lower bank, or the simultaneous operation of a similar number of the keys of the upper bank; also the simultaneous operation of keys of the upper and lower banks, provided they are not adjacent to each other. This feature of my invention is not limited to the particular construction and arrangement of the locking devices I have shown and described, it being sufficient if they are arranged to be operated in the manner described by the keys of the upper bank to lock their adjacent keys of the lower bank.

Having thus fully described my invention, I claim—

1. In a cash register and indicator having a series of operating-keys whose front ends are arranged in two banks, one above the other, the combination, with said keys, of a series of locking devices which permit the simultaneous operation of two or more keys, but are actuated by the operation of a key of the upper bank to lock the adjacent keys of the lower bank from operation until the key of the upper bank is returned to normal position, substantially as and for the purpose described.

2. In a cash register and indicator, the combination, with the operating-keys B B′, arranged in two banks, of the locking-hangers T, pivoted above the rear ends of the keys B′ and arranged to be displaced by the operation thereof to lock the adjacent keys B of the lower bank, but permitting the simultaneous operation of two or more of the keys B B′, substantially as and for the purpose described.

3. In a cash register and indicator, the combination of the operating-keys B B′ and the registering-wheels S S′, actuated thereby, the wheel S being provided with a projection a', arranged to engage the ratchet of the wheel S′ at each complete revolution of the wheel S, and the ratchet of the wheel S′ having one tooth omitted to leave a vacant space at b', substantially as and for the purpose described.

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Witnesses:
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TOM C. COFFMAN.