(No Model.)

G. KNAPP & C. H. LITTLE.

CASH INDICATOR AND REGISTER.

No. 481,037. Patented Aug. 16, 1892.

Fig. 2.

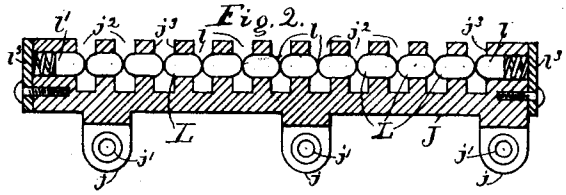


Fig. 3.

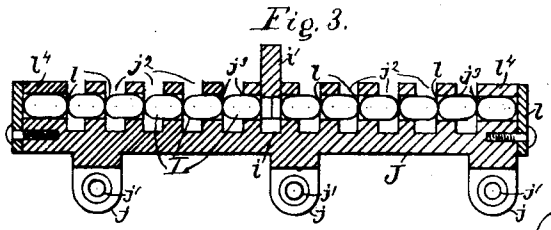


Fig. 1.

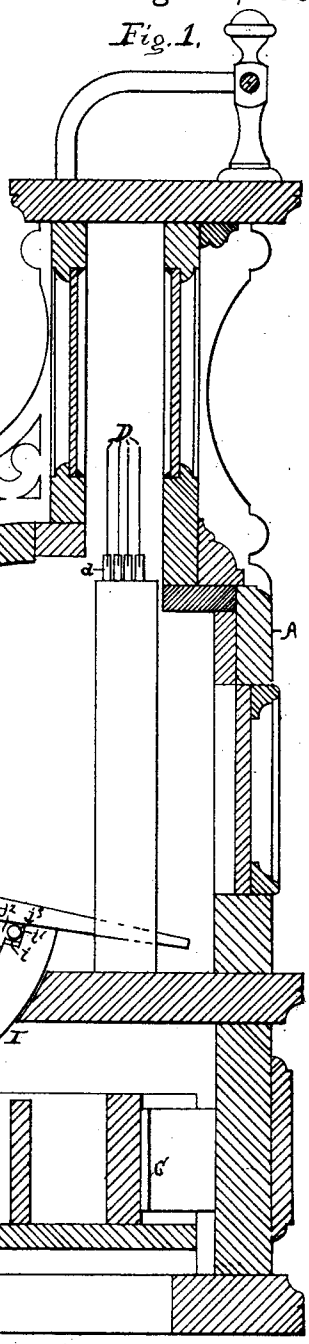


Fig. 5x.

Fig. 4.

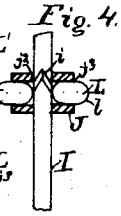


Fig. 7.

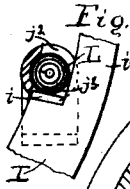


Fig. 6.

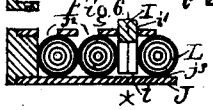


Fig. 8.

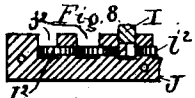
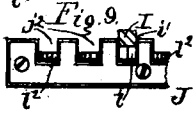


Fig. 9.



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UNITED STATES PATENT OFFICE.

GARDNER KNAPP, OF SOMERVILLE, AND CHARLES H. LITTLE, OF CHELSEA, MASSACHUSETTS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE BOSTON CASH REGISTER COMPANY, OF PORTLAND, MAINE.

CASH INDICATOR AND REGISTER.

SPECIFICATION forming part of Letters Patent No. 481,037, dated August 16, 1892.

Application filed November 20, 1888. Serial No. 291,412. (No model.)

To all whom it may concern:

Be it known that we, GARDNER KNAPP, residing at Somerville, in the county of Middlesex, and CHARLES H. LITTLE, residing at Chelsea, in the county of Suffolk, State of Massachusetts, citizens of the United States, have invented a certain new and useful Improvement in Cash-Registers and other Machines, of which the following is a specification.

Our invention relates to cash-registers and other machines such as are operated by the depression of keys or pivoted levers; and it consists in the means hereinafter described and claimed for preventing the simultaneous depression of more than one key at a time.

In the accompanying drawings, Figure 1 is a vertical central section from front to back of so much of a cash-register with our improvement applied thereto as is necessary for the understanding of said improvement; Fig. 2, a horizontal cross-section of the stop-case, or case which contains the stops, in the plane of the axis of said stops and a plan of the stops and springs. Fig. 3 is a section of the stop-case like that shown in Fig. 2, omitting the springs and showing the stops, and also one of the keys partly depressed and in section in the same plane as the section of the stop-case and showing a stop-separator or the part of a key which passes between the stops in plan; Fig. 4, a front elevation of two adjacent stops and of the stop-separator raised and a vertical section in the axis of said stops of a part of the stop-case, the stops in the above-mentioned figures being represented as round-ended cylinders; Fig. 5, a vertical section of a part of the stop-case through the centers of the stops and a front elevation of some stops and of a stop-separator in a raised position between two of said stops; Fig. 6, a horizontal section of the stop-case through the centers of the stops and a plan of some stops and of a stop-separator in the position shown in Fig. 5; Fig. 7, a side elevation of one of the stops and of part of a stop-separator in its normal position (not raised) and a vertical section of the stop-case on the line x x in Figs. 5 and 6, the stops in Figs. 5 to 7 being represented as balls or spheres; Fig. 8, a horizontal section of a part of the stop-case through the centers of the stops and a plan of some stops and of a stop-separator in a raised position; Fig. 9, a plan of the parts shown in Fig. 8, the stops shown in Figs. 8 and 9 being represented as disks.

The case A, drawer B, and drawer-opening spring C are or may be of any usual construction.

The signals D, supported upon the vertical signal-rods d and bearing numbers corresponding to numbers on the front ends or buttons k of the keys K, and the keys K, having their fulcrums upon a horizontal rod k', are or may be substantially as shown in United States Letters Patent No. 370,363, granted September 20, 1887, to Jerome J. Webster for improvement in cash indicator and register, except that the key is provided with a stop-separator I, hereinafter described.

It will be understood that the parts above mentioned are intended to be used with registering-wheels and mechanism for operating said registering-wheels by the depression of said keys; but such registering devices form no part of the present invention and are therefore not shown in the drawings and need no description. It is sufficient for the present purpose to say that any well-known registering devices adapted to be operated by the depression of the keys may be used in connection with the parts shown—as, for instance, the registering devices shown in said patent to Webster.

In carrying out our invention we prefer to provide each key K with a stop-separator I, the same being substantially an arc-shaped piece having its center of curvature in the axis of the fulcrum-rod k', on which the key turns, and having a uniform thickness laterally, except that the upper edge i of said stop-separator is wedge-shaped, as shown in Figs. 3 to 9. The stop-separator is connected to the key K by a web or upward extension i', which reaches from the rear part of the upper edge of said separator to said key, the separator, web, and key being preferably cast in one piece. The stop-case J consists, substantially, of a tube provided with feet j, by means of which it is secured to the table horizontal

portion *a* of the case A by means of screws passing through screw-holes *j'* in said feet. The stop-case J is arranged at right angles to the keys and parallel with the fulcrum-rod *k'*. The stop-case J is provided with as many vertical slots j^2 as there are keys, arranged at equal intervals with said keys, these slots being on the back of the case and extending through the horizontal opening j^3 or bore of said case. The case is so arranged that the slots j^2 allow the stop-separators to pass upward through them when the keys are depressed, so that were it not for the stops L described below all the keys might be depressed simultaneously, each stop-separator passing up through one of the slots j^2.

The stops L (shown in Figs. 2 and 4) consist of short cylinders having a sufficient diameter to fit the horizontal bore of the case j^3 with a sliding fit and each having pointed or rounded ends *l*, the aggregate length of all the cylinders being shorter than the inside length of said stop-case—that is, the length between the outer sides of the slots j^2 nearest the ends of the case by just the lateral thickness of a single stop-separator, so that the depression of any key will by pushing the stops aside close all the intervals between the stops, except the one occupied by the stop-separator first raised, and thereby prevent any other stop-separator from being raised, or, in other words, prevent the depression of any other key.

Balls L' may be used in place of the stop-cylinders L in precisely the same way as said stop-cylinders if the central opening or bore of the stop-case be made of sufficient diameter, as shown in Fig. 5, the balls rolling instead of sliding. Obviously disks l^2, as shown in Fig. 6, may be used to effect the same purpose as the cylinders and balls above referred to, the disks being arranged to roll in a suitable case and in the same plane with each other. In any form of the stops it is necessary that the combined length of the stops taken on a horizontal line through the centers of the stops should be less than the inside length of the case by an amount equal to the lateral thickness of the stop-separator. It is also apparent that the stops may be arranged above the rear arms of the keys or under the front arms of the keys and operate upon and be operated upon by said arms directly, said arms in that case being properly shaped to separate the stops.

The stops above described may be used with any series of keys, where, for any reason, it is desired to prevent the simultaneous operation by accident or intention of two keys of the same group, but will be found to be especially useful in machines where the simultaneous depression of two keys will operate the machine to an extent not greater than is due to the depression of one of said keys. The number of stops required is equal to the number of spaces between the keys of the group, the parts marked *l'* in Fig. 2, although resembling in form the stops L, not serving as stops, but merely as followers impelled by springs l^3 to hold the stops proper in contact with each other when no key is depressed and to bring the points of contact of the adjacent stops in the center of the slots j^2. The parts l^4 in Fig. 3 likewise do not serve as stops, but merely fill the ends of the opening in the case and prevent the stops from reaching entirely across the slots j^2, it being more convenient in forming the stop-case of cast metal to drill it entirely through from end to end to receive the stops.

We claim as our invention—

1. In a register, the combination, with two adjacent movable parts, as keys, of an arrester consisting of a rolling piece or body of a diameter greater than the space in the parts between the keys and a channel or holder for receiving and guiding such rolling arrester-body, substantially as described.

2. The combination of a series of keys, a tube or stop-case arranged at right angles with said keys and provided with a number of slots equal to the number of said keys, and a series of stops capable of rolling in said stop-case and arranged side by side within the same, the length of the combined diameters of said stops being less than the interior length of said case by the transverse thickness of said key when the same in being depressed strikes said stops, substantially as described.

3. The combination of a series of keys, each provided with a stop separator having a uniform thickness laterally, a tube or stop-case arranged at right angles with said keys and provided with a number of slots equal to the number of said keys, each of said slots being adapted to admit one of said keys, and a series of stops capable of rolling in said stop-case and arranged side by side within the same, the length of the combined diameters of said stops being less than the interior length of said case by an amount as great as the transverse thickness of a stop-separator, substantially as described.

4. In a cash register and indicator, the combination of the operating-keys and the stops made in the form of balls and arranged to operate substantially as described.

5. In a cash register and indicator, the combination of the operating-keys provided with extensions and the stops made in the form of balls, substantially as described.

In witness whereof we have signed this specification, in the presence of two attesting witnesses, this 12th day of November, A. D. 1888.

GARDNER KNAPP.
CHARLES H. LITTLE.

Witnesses:
SAM. H. LIBBY,
JEROME J. WEBSTER.