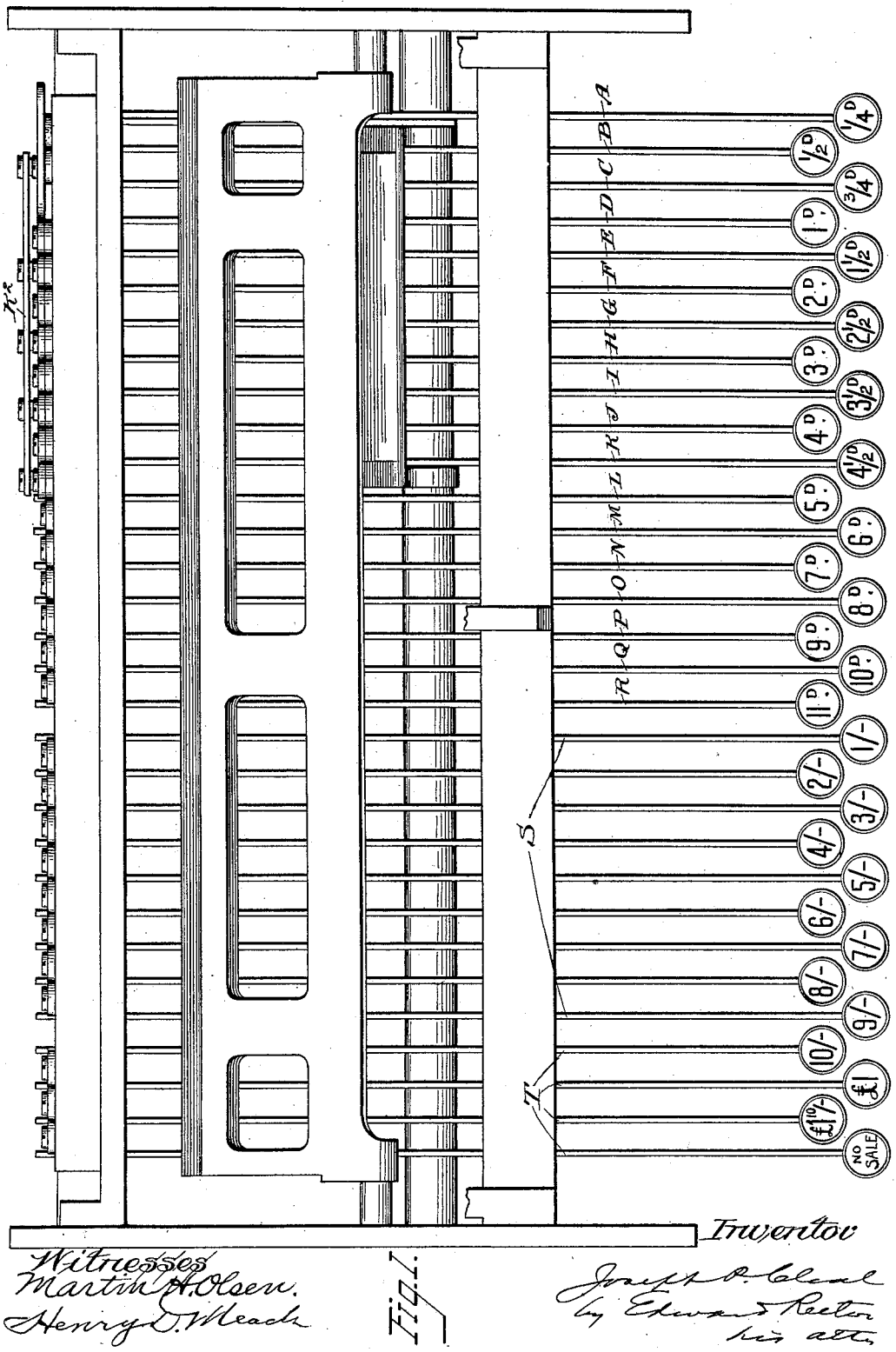
(No Model.) 3 Sheets—Sheet 1.

J. P. CLEAL.

CASH REGISTER AND INDICATOR.

No. 564,738. Patented July 28, 1896.



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Henry D. Meade

Fig. 1.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

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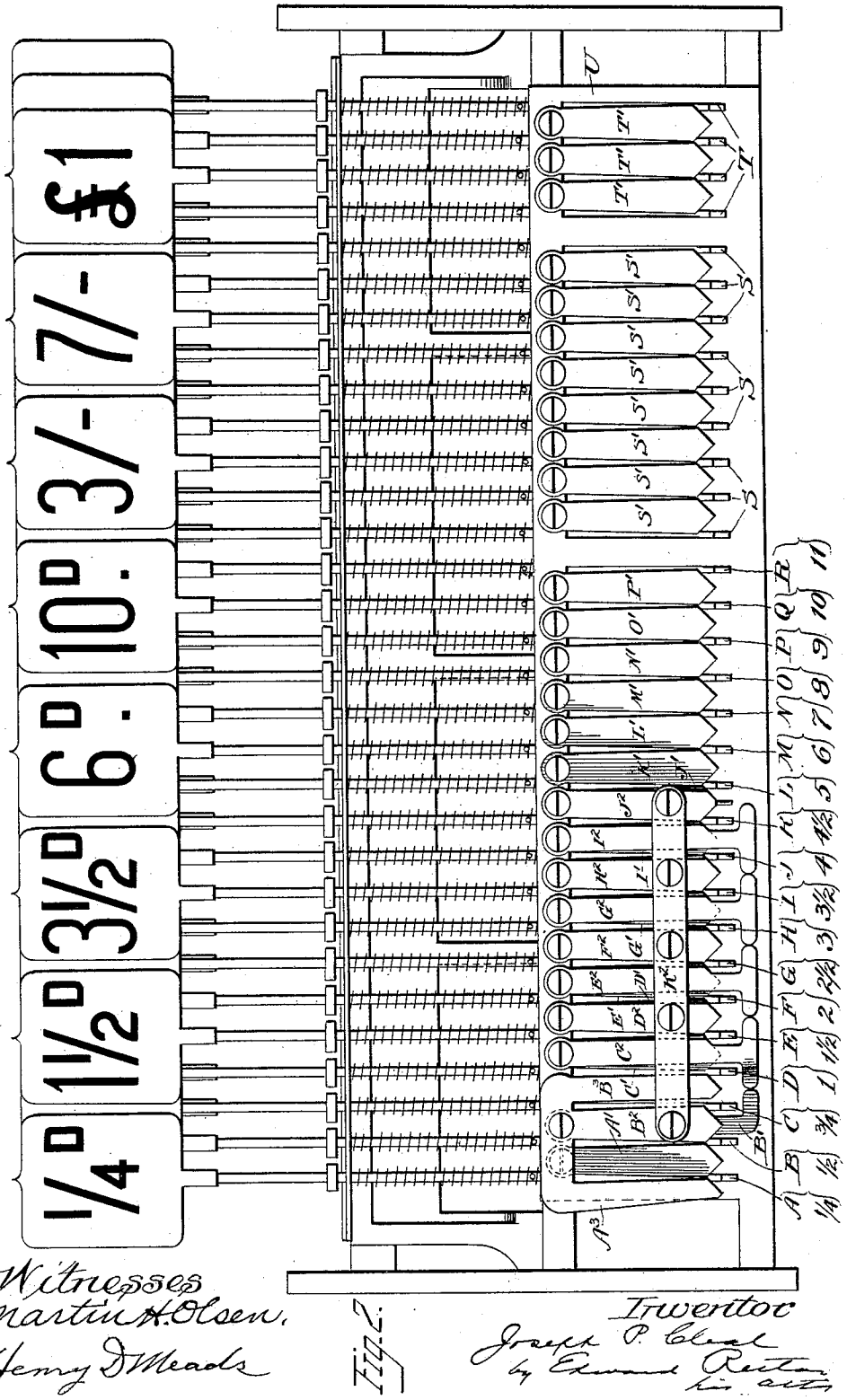

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Fig. 1.

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(No Model.) 3 Sheets—Sheet 3.

J. P. CLEAL.

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Fig. 3.

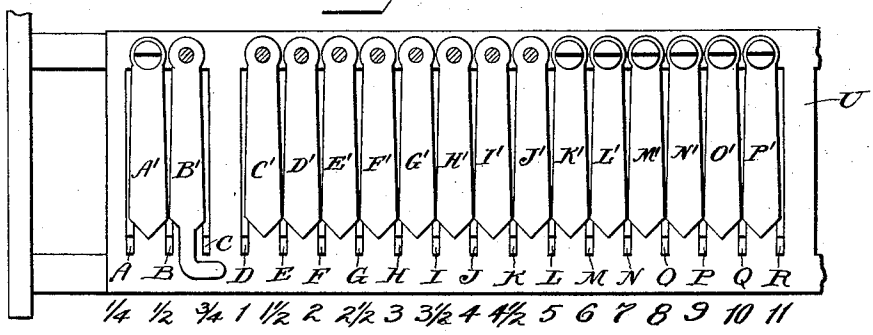


Fig. 4.

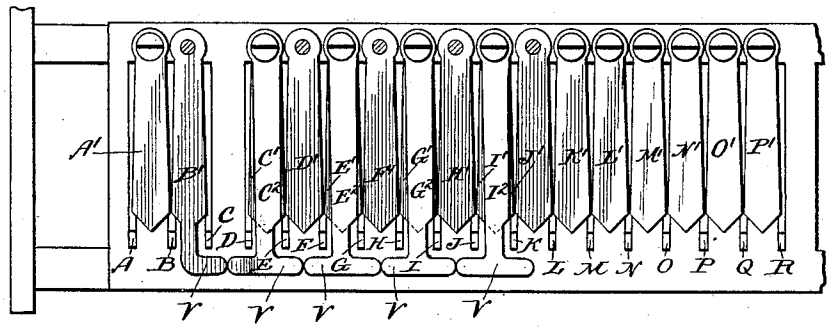
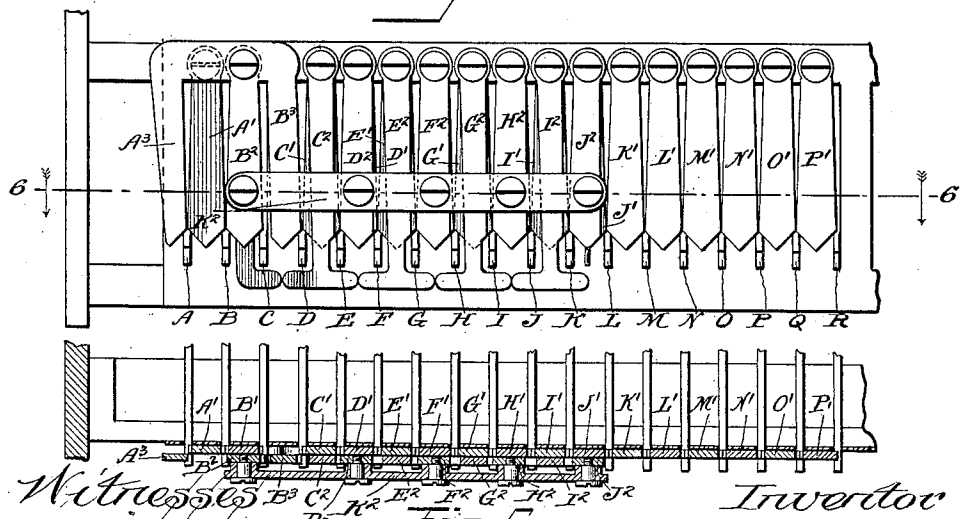


Fig. 5.



Witnesses:
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Fig. 6.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOSEPH P. CLEAL, OF DAYTON, OHIO, ASSIGNOR TO THE NATIONAL CASH REGISTER COMPANY, OF SAME PLACE.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 564,738, dated July 28, 1896.

Application filed March 23, 1896. Serial No. 584,445. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH P. CLEAL, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented a certain new and useful Improvement in Cash-Registers, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

My invention has for its principal object the provision of means for preventing the simultaneous operation of certain keys of the machine, and permitting the simultaneous operation of certain other keys. It has heretofore been common in machines of this class to provide means whereby the simultaneous operation of two or more keys in a given set or group was prevented, while the independent operation of single keys in such sets or groups was permitted, such means generally consisting of a series of laterally-movable stops arranged in the path of the keys in such manner that when a single key was operated it would push the stops aside and pass between the two immediately above it, while when it was attempted to operate two or more keys at once they would be locked against the intermediate stop or stops. The provision of means for this purpose is a comparatively simple matter, and stops such as those referred to have been employed for the purpose in many different forms; but it is also desirable, in some instances, to provide means for preventing the simultaneous operation of certain keys in a given group or set, while permitting the simultaneous operation of certain other keys in such group or set, and my invention has for its object the provision of means for this last-mentioned purpose. Inasmuch as the invention is of especial utility in machines for use in connection with English money, where fractions of the unit of value are frequently used, I have illustrated in the accompanying drawings a machine which I have built for that purpose; but it will be understood from the explanation of the invention which will be given that its utility is not confined to such machines, but extends as well to machines for the handling of American money.

In the machine illustrated in the drawings there are employed three sets or groups of keys, one representing pence, the second shillings, and the third pounds, the latter group also including in the present instance a special key, which latter, however, has no connection with my invention. The keys representing pence run as follows: "¼," "½," "¾," "1," "1½," "2," "2½," "3," "3½," "4," "4½," "5," "6," "7," "8," "9," "10," and "11." Now, under such an arrangement of keys, inasmuch as there are provided, in addition to the one-half-penny key, keys representing one and one-half, two and one-half, three and one-half, four and one-half pence, it follows that in order to indicate and register the latter values it is not necessary to operate a combination of the half-penny key with the one, two, three, and four penny keys, and it is moreover desirable, for practical reasons which need not be explained in detail, that such combinations shall not be operated, and that when an amount representing either one of such four values is to be registered that some one of the single keys representing such values shall be operated. It is therefore necessary to provide means for preventing the simultaneous operation of the half-penny key with either the one, two, three, or four penny keys, while permitting its simultaneous operation with the five-penny key and those of higher value. Inasmuch, also, as there are provided two-penny, three-penny, four-penny, and five-penny keys, it is not desirable that such values be indicated and registered by operating the half-penny key in connection with the one and one-half, two and one-half, three and one-half, or four and one-half penny keys, and it is therefore necessary to provide means for preventing the simultaneous operation of the half-penny key in connection with either one of said last-mentioned keys. Inasmuch, however, as the one-fourth-penny key is the only key representing that fraction of a penny, either alone or in addition to any other amount, it is desirable that simultaneous operation of the one-fourth-penny key in connection with the one, two, three, four, and five penny keys and those of higher values be permitted. On the other hand, inasmuch as there is a three-fourths-penny key provided, it is not desirable that simultaneous

operation of the one-fourth-penny and one-half-penny keys, or simultaneous operation of the one-fourth-penny key with either the one and one-half, two and one-half, three and one-half, or four and one-half penny keys be permitted, and it is therefore necessary to provide means which, while permitting the simultaneous operation of the one-fourth-penny key with any one of the penny-keys representing whole numbers, will prevent the simultaneous operation of it with any one of the keys representing a fractional number. Furthermore, because of the combination which may be made of the one-fourth-penny key with any one of the penny-keys representing a whole number, it is not desirable that simultaneous operation of the three-fourths-penny key with either one of the penny-keys representing a fractional number be permitted, and it is therefore necessary to provide means which, while permitting the operation of the three-fourths-penny key with any one of the penny-keys representing a whole number, shall prevent such operation of the three-fourths-penny key with any key representing a fractional number.

As before stated, it is not deemed necessary to explain in detail the practical reasons for the necessity or desirability of always indicating and registering a given value by means of a single key if one representing such value is provided instead of permitting the operation with a combination of two or more keys whose aggregate values represent such amount; but it may be stated here that one of the reasons is that in operating a combination of two or more keys, if such keys happen to be adjacent or near each other the indicator of one key is liable to more or less hide the indicator of the other key and thus produce confusion in the indication and permit fraudulent manipulations of the machine, while another reason relates to the registering mechanism of the machine, for the proper operation of which it is always desirable, and frequently absolutely essential, according to the character of the mechanism employed, that certain values shall be registered by the operations of certain keys and no others.

Having thus explained the general nature of my invention, I will now proceed to describe more in detail the particular machine illustrated in the drawings, and the means which I have provided for accomplishing the results above mentioned.

In the drawings, Figure 1 represents a top plan view of part of the framework, the operating-keys, and the universal bar overlying the keys, of a machine of this class with my invention applied to it; Fig. 2, a rear elevation of the machine; Fig. 3, a detail rear elevation of part of the machine with some of the swinging stops or hangers removed; Fig. 4, a view corresponding to Fig. 3, but with more of such hangers in position; Fig. 5, a view corresponding to Figs. 3 and 4, with still more of the stops or hangers in position; and Fig. 6, a detail horizontal section on the line 6 6 of Fig. 5.

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

Referring now to Fig. 1, it will be seen that the eighteen keys representing pence constitute the right-hand group or set of keys in the machine and are designated by the first eighteen letters of the alphabet, while the ten keys representing shillings constitute the next group at the left and are all designated by the letter S, while the three keys representing pounds and the special key marked "No sale," at the extreme left-hand side of the machine, are designated by the letter T.

Referring now to the rear view of the machine in Fig. 2, the corresponding letters of reference will be found applied to the rear ends of the keys, the latter consisting, as usual, of levers fulcrumed about midway of their length upon a horizontal rod fixed in the framework of the machine and provided upon their front ends with the numbered finger-buttons and resting at their rear ends in the lower ends of vertical slots in a guide-plate U, fixed to the rear side of the framework, in which slots the rear ends of the keys play up and down when their front ends are depressed and released. Pivotally supported above the rear ends of the keys are the swinging stops or hangers before mentioned, there being a separate group or set for each group or set of keys. The hangers for the four keys in the group T are three in number and lettered T′, while those for the group of keys S are eight in number and designated by the letters S′. These two groups of hangers are the same in all respects, and coöperate in the same manner with the keys of their respective groups as those hitherto in use. It will be seen that each hanger is pivoted immediately above the space between two keys and that its lower portion is somewhat wider than such space. The lower ends of the hangers are pointed (or may be rounded) to facilitate the upward passage of the keys between them. When the front end of any single key is depressed, its rear end, as it rises, will simply spread apart the two hangers immediately above it and pass between them, but if the front ends of two adjacent keys be depressed at once their rear ends will contact with the opposite sides of the lower end of the hanger immediately above them and be arrested by it, while if two non-adjacent keys are depressed at once the several intermediate stops, being together wider than the space between such keys, likewise lock them from upward movement. In each of the groups S and T, therefore, it is not possible to operate any two keys at once, but inasmuch as there is left a vacant space between the group of hangers S′ and the group T′ it follows that any key in the group S may be operated simultaneously with any key in the group T. A vacant space being likewise left at the left of the hangers S′ in Fig. 2, between them and

the hangers coöperating with the pence-keys, it follows that any one of the latter keys may be operated simultaneously with any one of the keys in the groups S and T.

Referring now to the pence group of keys, to which my invention relates, it will be seen that in Fig. 3 there is one of the swinging stops or hangers pivoted in the space between each two adjacent keys, excepting between the keys C and D, the result of which is that no two of the keys A, B, and C can be simultaneously operated, and no two of the keys from D to R, inclusive, while either one of the keys A, B, and C may be operated simultaneously with either one of the keys from D to R. With only the hangers shown in Fig. 3, therefore, the pence-keys would be separated into two groups or sets, with respect to the hangers, the keys A, B, and C constituting one group or set and the keys from D to R the other. It is necessary to omit the hanger between the keys C and D, and thereby separate the pence-keys into two sets or groups, as it were, in order to permit simultaneous operation of certain of the keys A, B, and C with certain of the keys D to R, but inasmuch as this leaves the keys A, B, and C free to be operated with all of the keys D to R, (that is, with any one of them,) it is necessary to provide additional stops intermediate certain ones of the keys A, B, and C and certain ones of the keys D to R, whereby the simultaneous operation of such keys may be prevented.

The keys A, B, and C, as shown in Fig. 1, and as also indicated in Fig. 3, are the one-fourth-penny, one-half-penny, and three-fourths-penny keys, while the amounts represented by the keys from D to R are also indicated in Fig. 3. As before explained, it is desired that the one-fourth-penny key A be left free to be operated simultaneously with either one of the keys D F H J L and the remaining pence-keys M to R, but shall not be free to be operated with either one of the keys E, G, I, and K; also, that the one-half-penny key B shall not be free to be operated with either one of the keys from D to K, but shall be free to be operated with either one of the keys L to R; and, further, that the three-fourths-penny key C shall be free to be operated with either one of the keys D F H J L and the keys M to R, but shall not be free to be operated with either of the keys E, G, I, and K. The stops or hangers shown in Fig. 3 may be termed the first "row" or "set," all of them fitting directly against the vertical plate U, in whose slots the rear ends of the keys rest. In Fig. 4 there is shown the second set or row of hangers added to those of Fig. 3. These additional hangers are four in number, C^2 G^2 E^2 I^2, and are hung in the spaces between the keys D and E, F and G, H and I, and J and K, respectively. They are not, in the present instance, of the same shape as the other hangers, being cut away upon one side, so that only their opposite sides coöperate with the keys. In the present instance their left-hand sides are cut away or formed to hang in vertical lines and have no coöperation with the keys D, F, H, and I. The right-hand sides of the hangers project over the keys E, G, I, and K and serve to lock the latter keys so long as the hangers are maintained in their normal or right-hand position. The lower end of these hangers C^2 E^2 G^2 I^2 do not terminate in points, as do the other hangers, but extend downward between the keys and below are formed into T-shaped heads V, which abut directly against each other, or stand so near each other that the movement of any hanger in one direction serves to move all of the other hangers which are upon that side of it.

The hanger B′, which occupies the space between the keys B and C, is shaped at its lower end like the hangers C^2 E^2 G^2 I^2, just described, or at least is provided with one-half of a T-shaped head, which extends to the right into contact with or close proximity to the head of the hanger C^2, the left-hand end of the head V of the latter hanger being bent inward toward the plate U, as indicated by the shaded lines upon it, to bring it into the same vertical plane as the end of the hanger B′. The result of this provision of the hangers C^2, E^2, G^2, and I^2, and their cooperation with the hanger B′, is that whenever either the key A or the key B is operated the hanger B′, being forced slightly to the right, will move all four of the other hangers in that direction, or at least maintain them in their normal right-hand position, (shown in Fig. 4,) in which position, as before stated, they lock the keys E, G, I, and K from movement. Likewise, when either one of the keys E, G, I, or K is operated the hangers A′ and B′ will be forced to the left, or at least maintained in their normal position, (shown in Fig. 4,) in which position they lock the keys A and B from movement. The result of this is that neither one of the keys A and B can be operated simultaneously with either one of the keys E, G, I, and K.

Upon reference to Fig. 3 it will be seen that the keys E, G, I, and K represent, respectively, one and one-half, two and one-half, three and one-half, and four and one-half pence, so that the provision of the hangers just described prevents the simultaneous operation of either one of such keys with either the one-fourth-penny key A or the half-penny key B. Thus an additional portion of the sought-for result is attained by the provision of the hangers C^2 E^2 G^2 I^2 and their coöperation with the hangers A′ B′; but the complete result is not attained for the reason that the half-penny key B is still left free to be operated simultaneously with the keys D, F, H, and J, representing one, two, three, and four pence, respectively, while the three-fourths-penny key C is left free to be operated simultaneously with any one of the keys D to R. Inasmuch as, for the reasons heretofore stated, operation of

the half-penny key B simultaneously with either of the keys D, F, H, and J is to be prevented, and likewise simultaneous operation of the three-fourths-penny key with either one of the keys E, G, I, and K, it follows that additional stops must be provided for that purpose, and which will at the same time permit simultaneous operation of the three-fourths-penny key C with either of the keys D, F, H, and J, as well as with the higher keys L to R. To this end the additional stops shown in Figs. 2 and 5 are provided, where it will be seen that there is a hanger D^2 hung upon the pivot of the hanger D', a hanger F^2 upon the pivot of the hanger F', a hanger H^2 upon the pivot of the hanger H', and a hanger J^2 upon the pivot of the hanger J'. The hangers D^2 F^2 H^2 J^2 are connected by a link or bar K^2, pivoted to their rear sides, so that the movement of either one of the hangers serves to move all of them. The link K^2 extends to the left of the left-hand hanger D^2 and is pivoted at its end to a hanger B^2, hung upon the pivot of the hanger B', with the result that whenever the hanger B^2 is moved to the right by the operation of the key B all the hangers to which it is connected by the link K^2 will be moved in that direction, while when it is moved to the left by the operation of the key C all of such hangers will be moved toward the left. In the first instance, the movement of the hangers D^2, F^2, H^2, and J^2 to the right will cause them to lock the respective keys F, H, and J, so that no one of the latter keys can be operated simultaneously with the key B. Now, the keys F, H, and J represent, respectively, two, three, and four pence, so that it follows that the one-half-penny key B cannot be operated simultaneously with either of the keys representing two, three, and four pence. In the second instance, the movement of the hangers D^2 F^2 H^2 J^2 to the left, by the operation of the three-fourths-penny key C, causes said hangers to lock the keys E, G, I, and K, representing, respectively, one and one-half, two and one-half, three and one-half, and four and one-half pence, so that it follows that no one of said keys can be operated simultaneously with the three-fourths-penny key. So, too, when either one of the keys E, G, I, or K is operated the hanger B^2 is pulled to the right and locks the key C, as will be readily understood.

The stops above provided still leave the one-penny key D free to be operated simultaneously with either one of the keys A B C, but inasmuch as there is provided a one-and-one-half-penny key simultaneous operation of the key D with the one-half-penny key B is to be prevented, and to this end there is formed integral with or rigidly secured to the hanger B^2 a second hanger B^3, occupying the space between the keys C and D, and forming with the hanger B^2 a compound hanger. There is just sufficient space between the hangers B^2 and B^3 to permit the passage of the key C, and the width of the hanger B^3 is such that it permits simultaneous operation of the keys C and D. When, however, the half-penny key B is operated, the hanger B^3 will be swung to the right over the key D and thereby lock the latter, thus preventing simultaneous operation of the half-penny key and the one-penny key.

It will be noticed that there is also formed integral with the hangers B^2 and B^3 another hanger A^3, located at the left of the one-fourth-penny key A, the lower end of which hanger is moved to the right over said key whenever any one of the keys B, E, G, I, or K is operated, thus serving to lock the key A when any one of the last-mentioned keys is moved, and likewise causing operation of the key A to lock all of the keys B, E, G, I, and K. It has been heretofore explained that when either one of the keys E, G, I, and K is operated the key A will be locked by the hanger A' through the movement transmitted to said hanger by the T-heads of the hangers B', C^2, E^2, G^2, and I^2, and that likewise when the key A is operated the movement transmitted by the hanger A' to the hangers B', C^2, E^2, G^2, and I^2 will lock the keys C, E, G, I, and K. The hanger A^3 therefore serves as a double or auxiliary lock for the key A, and likewise as an auxiliary means for causing the operation of the key A to lock the keys E, G, I, and K. It is therefore not absolutely essential to the operation of the locking mechanism for the purpose described, but is provided in the machine from which the drawings of the present application were made because its presence, and its operation above described, render unnecessary such accurate construction and adjustment of the hangers B', C^2, E^2, G^2, and I^2 as would be necessary where their cooperation with the hanger A' was alone depended on for locking the key when one of the keys E, G, I, and K was operated, and vice versa.

From the foregoing description it will be understood that the series of keys from A to K, inclusive, is separated into two sets or groups, the keys A B C constituting one set or group, and the keys D to K the other, and it will also be seen that the key A is free to be operated simultaneously with any one of the keys D, F, H, and J, but cannot be operated with either one of the keys B, C, E, G, I, and K. Likewise the key C is free to be operated with either one of the keys D, F, H, and J, but cannot be operated with either one of the keys E, G, I, and K, while the key B is locked from operation with either one of the keys A, C, D, E, F, G, H, I, and K, but is free to be operated with any one of the higher keys L to R. It will be understood that if the keys B and C were removed from the left-hand set, leaving only the key A in said set, the locking operation between that key and the other keys would remain the same, while if the keys A and B were removed the locking coöperation of the key C with the other keys would likewise remain the same, so that the

invention may be utilized to advantage even where there is but a single key separated from the main set or group of the series, instead of several keys, as in the present instance. Again, in some instances the series of keys may be separated into more than two sets or groups, and the locking devices be so arranged as to permit the operation of certain keys of one set with certain keys of another set, but prevent their operation with certain other keys of such other set.

So far as I am aware I am the first in the art to combine a series of operating-keys or similar movable members separated (with respect to the locking mechanism) into groups or sets (whether one of said sets contains a single key or several keys) with a locking mechanism of any kind whatever which will permit the simultaneous operation of the key or keys of one set with certain keys of another set, and prevent its or their simultaneous operation with certain other keys of such other set, and my invention is of corresponding scope.

Having thus fully described my invention, I claim—

1. In a cash-register or other device, a series of keys or other movable members separated (with respect to the locking means hereinafter mentioned) into sets or groups, in combination with locking means which prevents simultaneous operation of the key or keys of one set with certain keys non-adjacent thereto in another set, but permits its or their simultaneous operation with certain other keys of such other set, substantially as described.

2. In a cash-register or other device, a series of keys or other movable members separated (with respect to the locking means hereinafter mentioned) into groups or sets, each containing a plurality of keys, in combination with locking means which prevents simultaneous operation of the several keys of one set with certain keys of another set, but permits simultaneous operation of them with certain other keys of such other set, substantially as described.

3. In a cash-register or other device, the combination of a series of keys or other movable members with locking means intermediate the several keys which prevents simultaneous operation of certain keys in the series with certain keys but permits their simultaneous operation with certain other keys of the series, substantially as and for the purpose described.

4. In a key-locking mechanism comprising a series of pivoted stops, a series of non-adjacent stops separated from each other by two or more keys and provided with T-heads adapted to contact or coöperate with each other in the manner and for the purpose described.

5. In a key-locking mechanism comprising a series of pivoted pendent hangers or stops, a series of non-adjacent hangers separated from each other by two or more keys and provided with T-heads at their lower ends adapted to contact or coöperate with each other in the manner and for the purpose described.

6. In a key-locking mechanism comprising a series of pivoted stops, the combination of a series of non-adjacent stops with a link connecting them together so that they move in unison, substantially as described.

7. In a key-locking mechanism comprising a series of pivoted stops or hangers, the combination of a plurality of such hangers, a compound hanger comprising a pivoted plate composed of a plurality of integral prongs or hangers, and a link connecting said compound hanger and the several individual hangers, whereby such connected hangers move in unison, substantially as described.

8. In a key-locking mechanism, the compound locking-hanger consisting of the pivoted plate having the integral hanger B^2 and the integral prong or hanger B^3 separated by a slot for the passage of a key, substantially as described.

9. The combination, with the keys A to K inclusive, of the hangers A′ B′ coöperating with the keys A, B, and C, the hanger B′ having the extension or T-head V at its lower end, and the hangers C^2, E^2, G^2, and I^2 coöperating with the keys E, G, I and K and provided at their lower ends with the T-heads V coöperating with the hanger B′, substantially as described.

10. The combination, with the keys A to K inclusive, of the hangers A′ B′ coöperating with the keys A, B, and C, the hanger B′ having the extension or T-head V at its lower end, the hangers C′ to I′ inclusive coöperating with the keys D to K inclusive, and the hangers C^2, E^2, G^2 and I^2 coöperating with the keys E, G, I and K and provided at their lower ends with the T-heads V coöperating with the hanger B′, substantially as described.

11. The combination of the keys A to K inclusive, the hangers A′ B′ coöperating with the keys A, B, and C, the hanger B′ having the extension or T-head V at its lower end, the hangers C′ to I′ inclusive coöperating with the keys D to K inclusive, the hangers C^2, E^2, G^2 and I^2 coöperating with the keys E, G, I and K, and having the T-heads V at their lower ends coöperating with the hangers B′, the hangers D^2, F^2, H^2 and I^2 alternating with the hangers C^2, E^2, G^2 and I^2, the compound hanger B^2 B^3, and the link K^2 connecting the hangers D^2, F^2, H^2, J^2 with the compound hangers B^2 B^3, substantially as described.

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Witnesses:
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