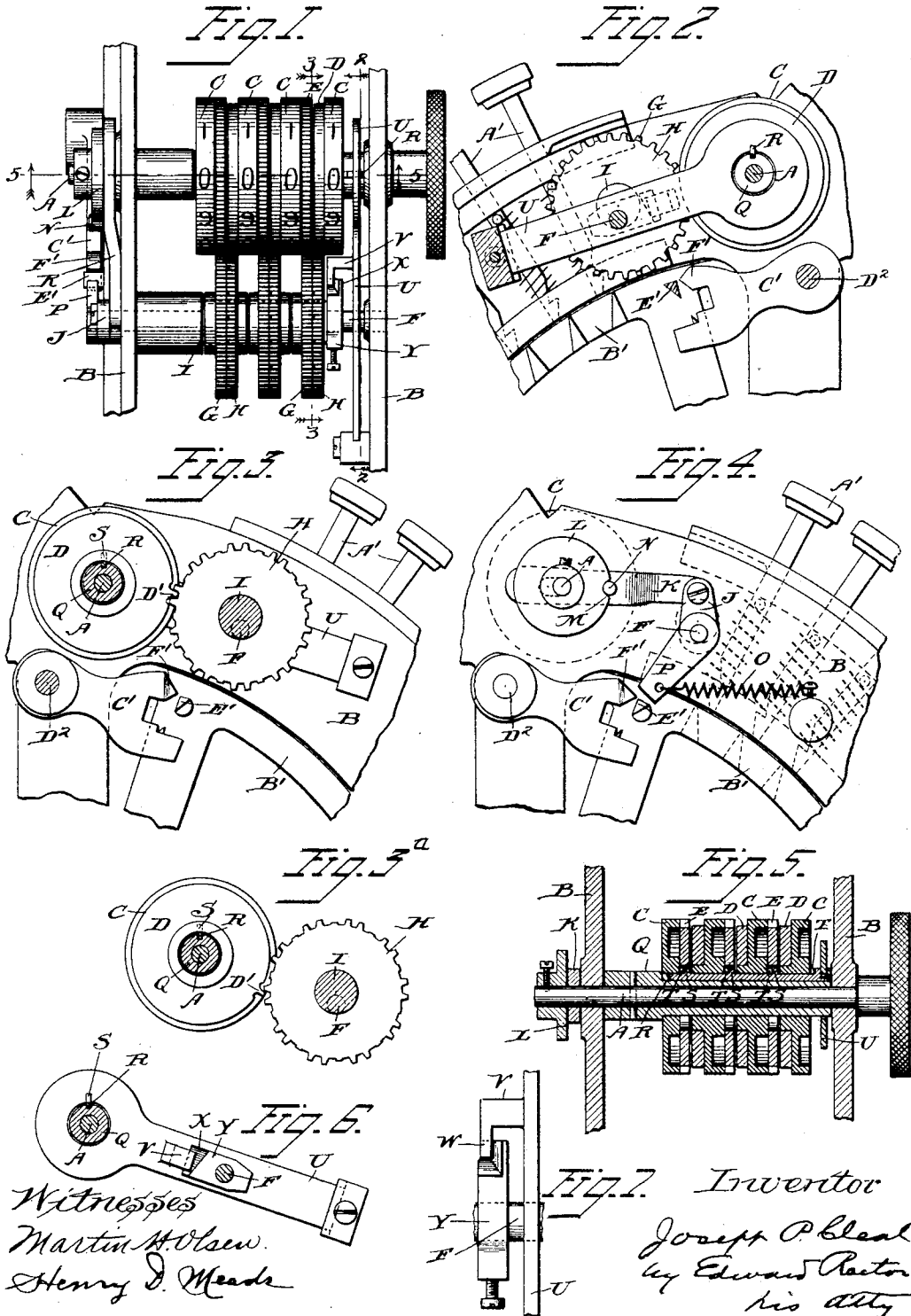


(No Model.)

J. P. CLEAL.
REGISTER.

No. 538,410.

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UNITED STATES PATENT OFFICE.

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

REGISTER.

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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 Registers, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates more particularly to that style of registers or counters in which the numbered registering wheels are mounted side by side upon one shaft, and in which the complete rotation of any one wheel is caused to advance the next higher wheel in the series one number by means of a train of transfer gears mounted side by side upon an axis parallel with the axis of the registering wheels and co-operating with gears and projections upon the respective wheels. Each registering wheel has fast upon it a gear meshing with one of the transfer gears and carries a tooth or projection which at each complete rotation of the wheel engages the transfer gear which meshes with the gear of the next higher registering wheel, so that at each rotation of the lower wheel the engagement of its single tooth or projection with said transfer gear will turn it and cause the next higher wheel to be advanced one number. In addition to the transfer gears there are usually mounted upon the same axis, one fast upon the side of each gear, a series of notched locking disks whose notches fit snugly against either the peripheries of the registering wheels or against co-operating circular locking disks fast upon their hubs, the purpose of which is to hold the transfer gears from movement except when turned by the tooth or projection on one of the registering wheels to effect the transfers. Now, in such registers, when the registering wheels are to be returned to zero or initial position it is necessary to disengage the two sets of locking disks from each other, to permit the registering wheels to turn. To this end the train of registering wheels and the train of transfer gears are usually mounted in separate frames, one movable relatively to the other, so that the two sets of devices may be thrown out of operative relation when the wheels are to be re-set to initial position and back into such

relation after they have been re-set. Heretofore it has been necessary to separate the two sets of wheels by one operation, and then re-set the registering wheels by another operation, and, in some instances, to then throw the two sets of wheels into co-operative relation again by a third operation.

My invention consists in the provision of means for making the act of separation and re-engagement substantially automatic, or incidental to the re-setting operation, so that it is only necessary to grasp the handle of the re-setting shaft upon which the registering wheels are mounted and give it a rotation in order to separate the transfer gears from the wheels, re-set the latter to initial position, and permit the re-engagement of the gears and locking disks.

The train of transfer gears may be separated from the train of register wheels so far as to disengage both the locking disks and the gears of the respective trains, in which event the transfer gears and their locking disks will remain stationary while the registering wheels are re-set to zero; or the two trains may be separated far enough to disengage two sets of locking disks, without entirely disengaging the two sets of gears, in which event the transfer gears and their locking disks will be turned with the registering wheels as the latter are re-set.

In the accompanying drawings I have illustrated my invention as applied to a well known style of cash register, such as that described in Patent No. 464,294, to Cook, dated December 1, 1891, and the adjustment of the parts is such that in this instance the registering wheels and transfer gears are separated at each re-setting operation only far enough to disengage the two sets of locking disks, although without any material variation the adjustment might be made such that both the locking disks and gears would be entirely disengaged from each other.

In said drawings, Figure 1 is a top plan view of a set of registering wheels and transfer devices and portions of the supporting side frames between which they are mounted; Fig. 2, an elevation of the right side of the same, being a vertical section immediately to the left of the right-hand side frame on the

line 2 2 of Fig. 1; Fig. 3, a vertical section on the line 3 3 of Fig. 1; Fig. 3^a, a detail view of a registering-wheel and its locking devices; Fig. 4, an elevation of the parts on the outer side of the left-hand side frame; Fig. 5, a vertical section through the train of registering-wheels longitudinally of the shaft upon which they are mounted; Fig. 6, an elevation of the left-hand side of the shifter-plate with some of the co-operating parts in section, and Fig. 7 a detail plan view showing the cams for operating the shifter.

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

15 The rotary re-setting shaft A is passed through and mounted in the side frames B B and has fastened upon its right hand end a milled disk by which it may be turned. The registering wheels C are arranged side by side upon this shaft. Each wheel except the left hand one has fast upon its left side a single-toothed disk D, and each wheel except the right hand one has fast upon its right side a gear E.

25 Mounted upon a rock shaft F journaled at its opposite ends in the side frames B B are the transfer gears which co-operate with the disks D and gears E of the wheels C. Each transfer gear consists of two halves G H, rigidly secured to or formed integral with each other the former being a plain gear meshing with the gear E of the next higher wheel C, and the latter being a mutilated gear, with every third tooth partly or wholly cut away, as seen in Fig. 3. These mutilated gears co-operate with the disks D of the wheels C and serve both as locking disks and as part of the transfer gears.

40 When the parts are in normal position the teeth upon the opposite sides of the spaces formed by the mutilated or cut-away teeth fit snugly against the peripheries of the disks D and thereby lock the transfer gears from turning, Fig. 3^a. The cut-away spaces leave the remaining full teeth in pairs, and at each rotation of the disk D its single tooth D' will enter between the two teeth of the upper pair which at the time are resting upon the disk and will turn the gear forward, the two notches or depressions at the opposite sides of the base of the tooth D', which are entered by the respective teeth of the pair, permitting the gear to turn, Fig. 3. The gear H of course carries the gear G with it, and as the latter meshes with the gear E of the next higher registering wheel C the latter will therefore be advanced the same distance as the gears—in this instance a tenth of a rotation.

60 The transfer gears are not mounted directly upon the rock shaft F, but upon eccentric sleeves or bearings I fast thereon. When therefore the shaft F is rocked forward the gears will be moved away from the registering wheels, either far enough to entirely separate the gears G from the gears E and the mutilated gears H from the disks D, or at least to separate the latter, so that the wheels

C may be turned freely, either with or without the gears G H being turned with them. In the present instance the adjustment of the parts is such that, by the means hereinafter described, the gears H are separated from the disks D, while the gears G remain slightly in mesh with the gears E, so that the turning of the wheels C turns the gears G H as well.

75 The rock shaft F has fast upon its left hand end, outside the frame B, an upwardly extending arm J, Fig. 4, to which is pivoted the front end of a plate K which is slotted at its rear end and embraces the shaft A. The latter has fast upon it a disk L having in its periphery a notch M in which fits a roller N on a stud upon the side of the plate K. A coiled spring O connected to the lower end of a second arm P fast upon and depending from the rock shaft F yieldingly holds the parts in normal position, with the transfer gears in co-operative relation with the registering wheels and the roller N fitting in the notch in the disk L. When the shaft A is turned and the roller thereby forced out of the notch in the disk the shaft F will be rocked and the transfer gears thrown forward and the registering wheels C permitted to be re-set. In this manner the mere turning of the shaft A to re-set the registering wheels serves to disengage the transfer gears and permit such re-setting.

Any of the usual or suitable devices may be employed for causing the shaft in its rotation to pick up the registering wheels and carry them with it, such as a longitudinal notch or groove in the shaft and spring pawls on the wheels co-operating with it; but in the present instance I have provided novel means for the purpose. As seen in Fig. 5 the wheels C are not mounted directly upon the shaft A, but upon an interposed sleeve Q fast upon the shaft. This sleeve has in it a longitudinal groove in which fits a slide R having a series of lugs S upon its outer side, one of which lugs fits within an annular recess in each gear E, the latter being fastened upon the right hand sides of the wheels C. The wheels C have lugs T projecting into these recesses and adapted to co-operate with the lugs upon the slide. When the latter is in its right hand position its lugs stand to the right of the vertical plane of the lugs T, so that the wheels C are free to turn upon the sleeve. When the slide is moved to the left its lugs are brought into the planes of the lugs T, and when the shaft A and sleeve Q are then turned the lugs S will engage the lugs T and pick up the registering wheels wherever they may have been left and carry them around with it to initial position.

Inasmuch as the slide R has to be moved to the left each time, to bring the lugs S into position to engage the lugs T of the wheels I have provided automatic means for so shifting the slide at the beginning of movement of the re-setting shaft A, which means may be now described.

Fitting over the right hand end of the sleeve

Q is the rear end of a spring arm or plate U secured at its front end to the right hand side of frame B. The right hand end of the slide R also passes through the opening in the plate U and is connected to it by its right hand lug S and a projection or pin upon the slide upon the other side of the plate, the latter fitting between the two, so that the rear end of the plate moves laterally with the slide. Secured upon the left hand side of this plate about midway of its length is a block V having a forwardly projecting beveled lug W which stands in the path of a cam X upon the rear end of an arm Y fast upon the rock shaft F, Fig. 7. When said shaft is rocked by the first movement of the re-setting shaft A the cam X is thrown upward and forces the plate U to the left and carries the slide R into position for its lugs to co-operate with those upon the registering wheels. When the rotation of the shaft A is completed and the shaft F rocked back to initial position by its spring the cam X will be thrown downward again and the plate U will spring to the right and return the slide to normal position. The pendent arm P upon the left hand end of the rock shaft F, to which the spring O is connected, Fig. 4, also serves as a locking device to automatically lock the operating keys and handle of the machine while the registering wheels are being re-set to zero.

As before stated the register of Figs. 1 to 7 is shown as applied to the machine of the Cook Patent No. 464,294. Upon reference to that patent it will be seen that the operating keys in each row co-operate with a curved detent plate which detains them in set position while the operating handle is being turned to effect the registration and indication. It will also be seen that the operating handle is normally locked from movement and that it is unlocked, to permit operation of it, by the movement of any one of the detent plates incident to pressing in or setting a key. Now, the pendent arm P above referred to serves to lock the detent plate B' from movement while the registering wheels are being re-set, and consequently locks the keys and prevents release of the handle.

In Figs. 2, 3 and 4 are illustrated such parts of the above mentioned devices as are necessary to an understanding of the locking operation of the arm P. A few of the upper keys A' of the left hand row of the machine are shown in said figures. Likewise the upper end of the detent plate B' with which they co-operate in the manner above described, and the recessed arm C' fast upon the rock-shaft D² and with the front end of which the lug E' upon the end of the detent plate co-operates. When the plate is forced rearward by pressing in a key the lug E' contacts with the beveled under side of the upper jaw F' of the recess in the front end of the arm C' and lifts the latter and rocks the shaft D², causing the latter to move an obstruction out of the path of the operating

handle at the other end of the machine, as may be readily understood without further illustration here, and as is fully shown and described in the patent aforesaid. Now, when the rock-shaft F' is rocked forward by the turning of the shaft A to re-set the registering wheels in the manner heretofore described, the lower end of the arm P is thrown rearward immediately over the front end of the jaw F' of the arm C' so that so long as the arm P remains in such position the front end of the arm C' cannot move upward. Consequently the contact of the lug E' with the jaw F' of the arm C' will prevent any upward movement of the detent plate B' and prevent operation of the keys and unlocking of the handle. In this manner the entire machine will be locked at the first re-setting movement of the shaft A and remain locked until said shaft has been given a complete rotation and the registering wheels brought to initial position.

As previously stated, it has heretofore been necessary in the use of registers of this class to disengage the transfer gears and locking disks from the registering wheels by one operation and to re-set the wheels by another. So far as I am aware I am the first in the art to combine with the re-setting means of such a register any sort of means for automatically separating the registering wheels and transfer devices by the act of re-setting the wheels, and my invention, in its broadest sense, is of corresponding scope.

Having thus fully described my invention, I claim—

1. In a register such as described, consisting of a train of registering wheels mounted upon a common axis and a train of transfer gears mounted upon a parallel axis, and co-operating locking devices intermediate the wheels and gears, the combination, with means for re-setting the registering wheels to initial position, of means actuated by the resetting means for automatically separating said wheels from the transfer gears to permit the wheels to turn, substantially as described.

2. In a register such as described, the combination, with the train of registering wheels mounted in a fixed frame, and means for re-setting them to initial position, of the train of transfer gears mounted in a movable support or frame, with the co-operating locking devices intermediate the wheels and gears, and means actuated by the re-setting means for moving the transfer gears away from the registering wheels to permit the latter to be turned to initial position, substantially as described.

3. In a register such as described, the combination of the rotary shaft, the registering wheels mounted thereon, means intermediate the wheels and shaft for causing the latter to pick up the wheels and carry them with it when turned in one direction, the gears and single-toothed disks fast upon the respective wheels, the transfer gears mounted on an axis

parallel with the rotary re-setting shaft, the notched locking disks or wheels fast upon the respective transfer gears and adapted to co-operate with the locking disks on the registering wheels, and means actuated by the rotary re-setting shaft for separating the transfer gears and locking disks or wheels from the gears and locking disks of the registering wheels to permit the latter to be returned to initial position, substantially as described.

4. In a register such as described, the combination of the rotary shaft, the registering wheels mounted thereon, means intermediate the wheels and shaft for causing the latter to pick up the wheels and carry them with it when turned in one direction, the gears and single-toothed disks fast upon the respective wheels, the transfer gears mounted on an axis parallel with the rotary re-setting shaft, the notched locking disks or wheels fast upon the respective transfer gears and adapted to co-operate with the locking disks on the registering wheels, a cam fast upon the rotary re-setting shaft, and means intermediate said cam and the transfer pinions for separating the latter and the locking disks from the gears and locking disks of the registering wheels to permit the latter to be returned to initial position, substantially as described.

5. In a register such as described, the combination of the rotary shaft, the registering wheels mounted thereon, means intermediate the wheels and shaft for causing the latter to pick up the wheels and carry them with it when turned in one direction, the gears and single-toothed disks fast upon the respective wheels, the transfer gears mounted on an axis parallel with the rotary re-setting shaft, the notched locking disks or wheels fast upon the respective transfer gears and adapted to co-operate with the locking disks on the registering wheels, a cam consisting of a notched disk fast upon the rotary re-setting shaft, a movable member spring-pressed against the periphery of said disk and normally resting in the notch therein, and connections between said member and the transfer pinions, whereby upon turning the shaft and disk the notch in the disk is carried away from the movable member and the latter forced outward and caused to ride upon the periphery of the disk and to move and maintain the transfer gears and their locking disks away from the registering wheels and their disks while the wheels are returned to initial position by the re-setting shaft, substantially as described.

6. In a cash register employing a register such as described, consisting of a train of registering wheels mounted upon a common axis and a train of transfer gears mounted upon a parallel axis, and the intermediate co-operating locking disks or wheels, the combination, with means for re-setting the registering wheels to initial position, of means actuated by the re-setting means to automatically separate the registering wheels and transfer gears, and means actuated by the separating means

to lock the machine from operation while the registering wheels and transfer gears are separated from each other, substantially as described.

7. The combination of the rotary shaft A, the registering wheels C mounted thereon and provided with the lugs T, the slide R intermediate the wheels and shaft and having the lugs S adapted to co-operate with the lugs T of the wheels, and means intermediate the shaft A and slide R and actuated by the shaft A for shifting the slide at the first re-setting movement of the said shaft into position for its lugs S to co-operate with the lugs T of the wheels, substantially as described.

8. The combination of the rotary shaft A, the registering wheels C mounted thereon and provided with the lugs T, the slide R intermediate the wheels and shaft and having the lugs S adapted to co-operate with the lugs T of the wheels, the spring plate U connected to the slide R and operating to yieldingly hold the latter in normal position, with the lugs S out of the planes of the lugs T, and means intermediate the shaft A and plate U for shifting the latter at the beginning of the re-setting movement of the shaft to move the slide R into position for its lugs S to co-operate with the lugs T of the wheels, substantially as described.

9. The combination of the shaft A, the registering wheels C mounted thereon and provided with the single-toothed disks D and gears E, means intermediate the shaft and wheels for causing the latter to be picked up and carried with the shaft when the latter is turned in one direction, the rock-shaft F, the transfer gears G H eccentrically mounted thereon and co-operating with the gears E and disks D of the registering wheels, the spring O yieldingly holding the shaft F in normal position, with the gears G H in position to co-operate with the gears E and disks D, and means intermediate the shaft A and shaft F for rocking the latter at the beginning of the re-setting movement of the shaft A to disengage the gears G H from the gears E and disks D, substantially as described.

10. The combination of the shaft A, the registering wheels C mounted thereon and provided with the gears E and disks D, means intermediate the shaft and wheels for causing the latter to be picked up and carried with the shaft when the latter is turned in one direction, the rock-shaft F, the transfer gears G H eccentrically mounted thereon and co-operating with the gears E and disks D of the registering wheels, the arm J fast upon the shaft F, the notched disk L fast upon the shaft A, the plate K connected to the arm J and having the stud N co-operating with the disk L, and the spring O operating to yieldingly hold the shaft F and connected parts in and return them to normal position, substantially as described.

11. The combination of the shaft A, the registering wheels mounted thereon, with

means intermediate the shaft and wheels for
re-setting the latter when the shaft is turned
in one direction, the keys A', the detent plate
B' co-operating therewith, the rock-shaft D²,
5 the arm C' fast thereon and co-operating with
a projection upon the detent plate D', the rock-
shaft F, the locking arm P fast thereon and
co-operating with the arm C', and means inter-
mediate the shaft A and shaft F for rock-
10 ing the latter and throwing the arm P into
position to lock the arm C' at the beginning
of the re-setting movement of the shaft A,
substantially as described.

12. The combination of the shaft A, the
15 registering wheels mounted thereon, with
means intermediate the shaft and wheels for

re-setting the latter when the shaft is turned
in one direction, the keys A', the detent plate
B' co-operating therewith, the rock-shaft D²,
the arm C' fast thereon and co-operating 20
with projection upon the detent plate B',
the rock shaft F', the arms J and P fast upon
said shaft, the arm P co-operating with the
arm C', the spring O connected to the arm P,
the notched disk L fast upon the shaft A, and 25
the plate K connected to the arm J and having
the stud N co-operating with the disk L, sub-
stantially as described.

JOSEPH P. CLEAL.

Witnesses:

PEARL N. SIGLER,
JOHN M. BUCKLES.