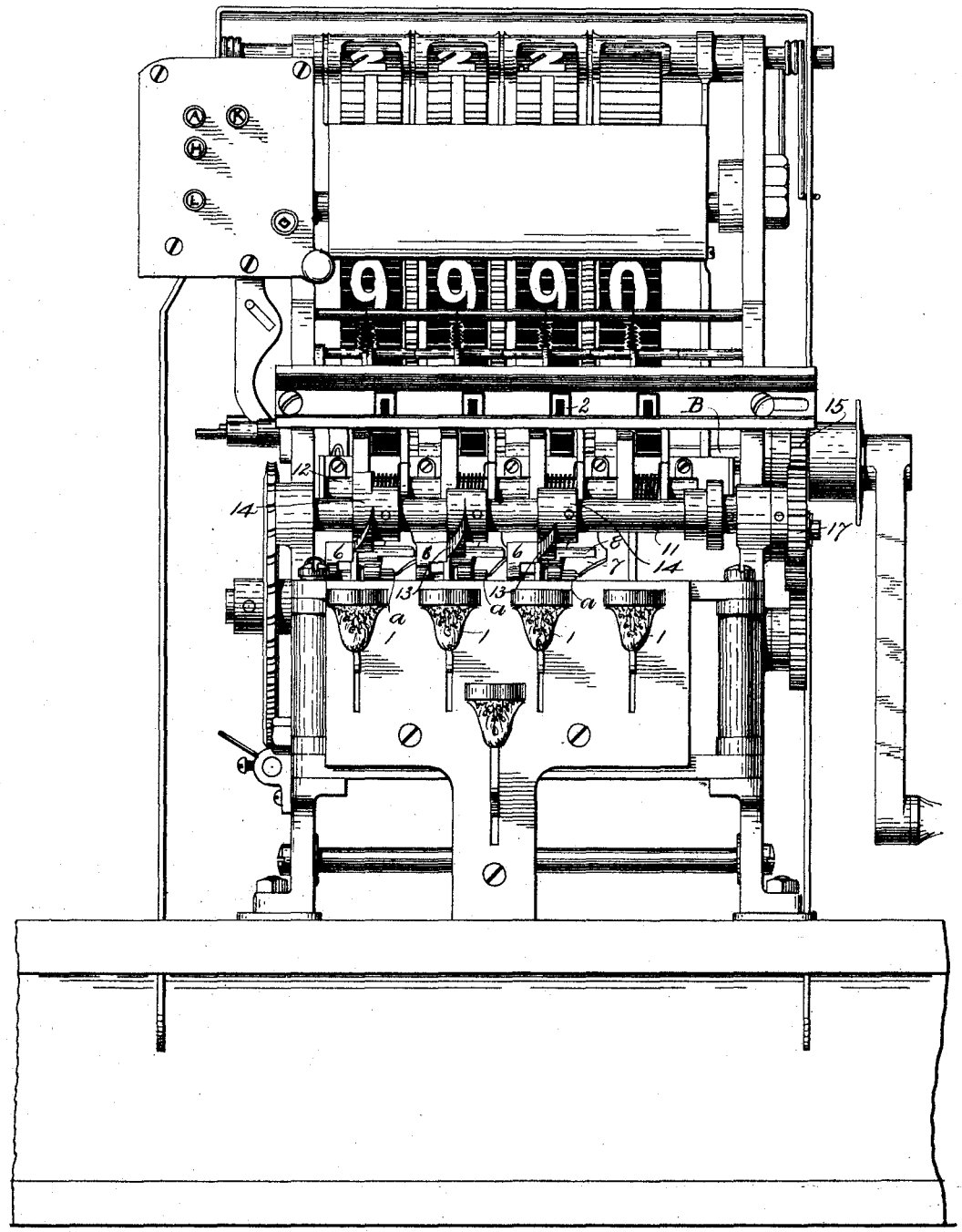
No. 619,763. Patented Feb. 21, 1899.

A. LATHAM.

CASH REGISTER.

(Application filed Oct. 14, 1897.)

(No Model.) 3 Sheets—Sheet 1.



WITNESSES

F. H. Ritzmann,

Fig. 1.

INVENTOR

Albert Latham,

per G. H. Huntington

Attorney

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(No Model.) 3 Sheets—Sheet 2.

Fig. 2.

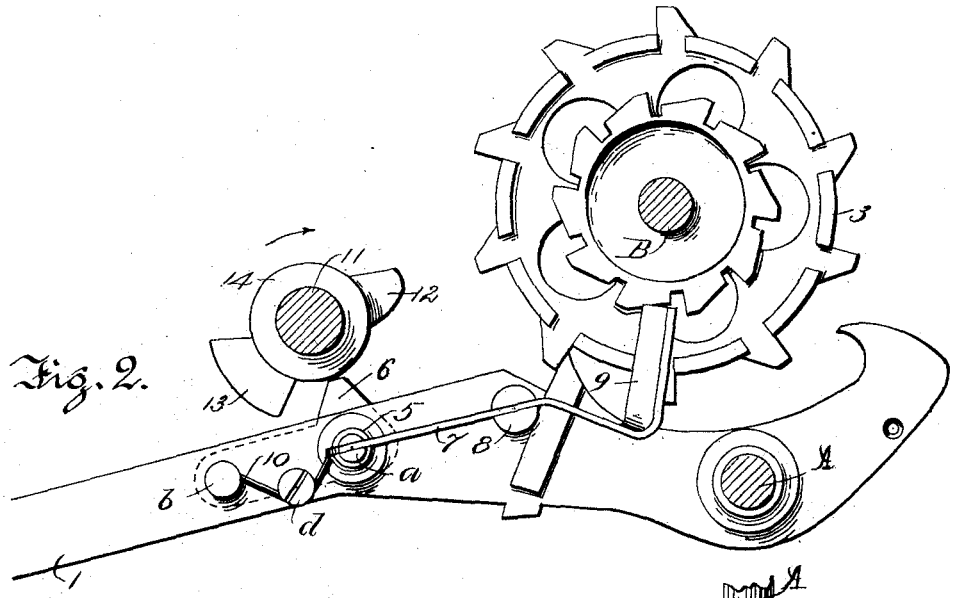
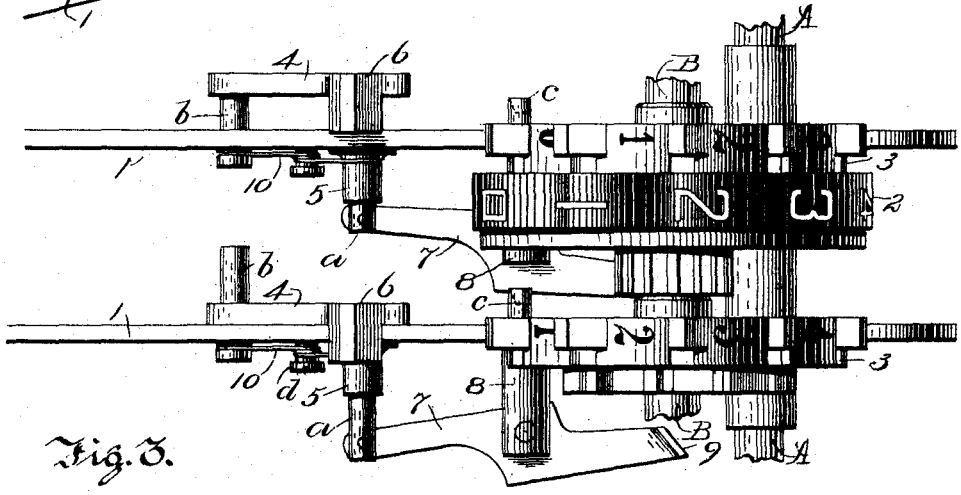


Fig. 3.



WITNESSES

F. W. Willis

F. H. Kitchener

INVENTOR

Albert Latham,

by George H. Huntington

Attorney

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A. LATHAM.

CASH REGISTER.

(Application filed Oct. 14, 1897.)

(No Model.) 3 Sheets—Sheet 3.

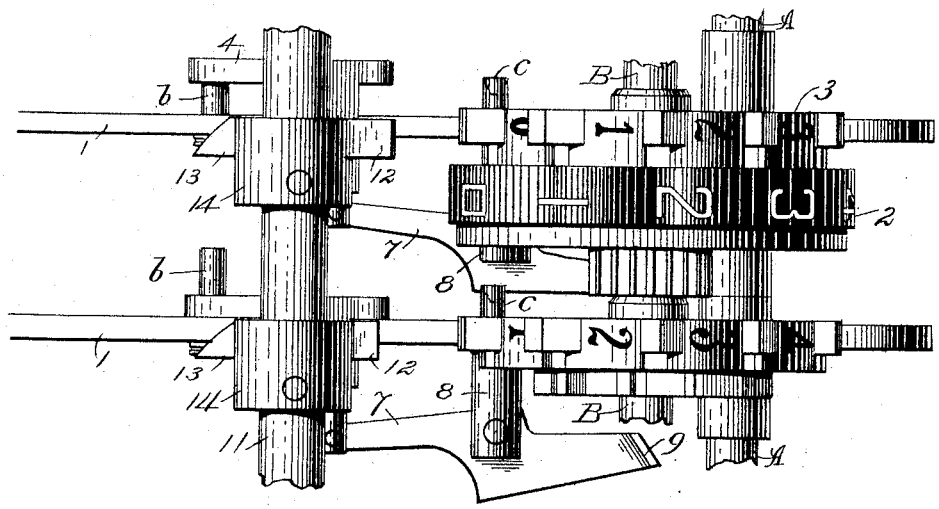

Fig. 4.

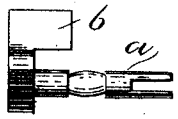

Fig. 5.

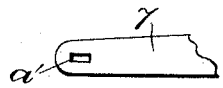

Fig. 6.

WITNESSES

INVENTOR

Albert Latham,

per G. H. Huntington

Attorney

UNITED STATES PATENT OFFICE.

ALBERT LATHAM, OF SPRINGFIELD, MASSACHUSETTS.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 619,763, dated February 21, 1899.

Application filed October 14, 1897. Serial No. 655,106. (No model.)

To all whom it may concern:

Be it known that I, ALBERT LATHAM, of Springfield, in the county of Hampden, State of Massachusetts, have invented a new and useful Improvement in Cash-Registers, of which the following is a specification.

My invention relates to cash-registers in which indication is effected by means of rotary indicators consisting of wheels having the necessary indices arranged on their peripheries. In machines of this nature adding-wheels or wheels which are adapted to present the sum total of indications successively presented by the indicating-wheels are generally employed, and it is to mechanism for transmitting motion from each adding-wheel of lower order to the adding-wheel of next higher order that my invention has particular reference.

In registers of the nature referred to and wherein separate key-levers are adapted to independently actuate one of a series of adding-wheels that together indicate the sum total that has been presented by the indicating-wheels it is well known that some intermediate mechanism between the members of each pair of adding-wheels in said system is necessary for the purpose of actuating the member thereof of higher order when the member thereof of lower order has completed a full rotation and has exhausted its indices. The operation of carrying over from one adding-wheel to the next one of higher order is usually performed through the medium of suitable mechanisms mounted upon all of the operating key-levers except that one from which motion is communicated to the adding-wheel of lowest order, said mechanism being so adapted to be actuated as to constitute an intermediate means by which when the crank for returning to the zero position the indicating-wheels (which are operatively connected with and arranged alongside of the adding-wheels in alternate relation therewith) is turned the key-lever of the wheel of higher order in each pair of adding-wheels is depressed to operate said wheel.

In view of the foregoing the object of my invention is to provide a transfer mechanism of the kind referred to which in the way of durability, strength, and simplicity and accuracy of operation of parts shall constitute an improvement upon the transfer mechanisms heretofore employed in cash-registers.

In the accompanying drawings, Figure 1 is a front elevation of a cash-register provided with my improved transfer mechanism. Fig. 2 is a side elevation of an adding-wheel, of a key-lever for the adjoining wheel of next higher order, and of my improved transfer mechanism. Fig. 3 is a plan view of two of the adding-wheels, of their key-levers, and of the portions of the transfer mechanisms which are carried by said levers. Fig. 4 is a plan view similar to Fig. 3, but showing the entire transfer mechanism; and Figs. 5 and 6 are detail views of minor parts of my invention.

In said drawings, 1 represents the operating key-lever for each pair of wheels, comprising an indicating-wheel 2 and an adding-wheel 3, the levers being fulcrumed on a common shaft A and the wheels being journaled on a common shaft B. Pallets on the ends of the key-levers engage teeth on the adding-wheels, and the operative relation between the key-levers and the wheels is such that actuation of the former will permit a step-by-step movement or rotation of the latter, with which the indicating-wheels move synchronously in the forward direction.

Each indicating-wheel is connected with suitable actuating means, and it is also suitably connected with the adding-wheel adjoining, so as to carry the latter forwardly with itself, but to be susceptible of rearwardly rotating independently of said adding-wheel, which is held against backward rotation.

Each key-lever except the one at the extreme right, which actuates the pair of wheels that includes the adding-wheel of lowest order, carries a set of elements which may be described as follows: A plate 4, having a laterally-projecting pin *a*, which penetrates the key-lever and is rigidly secured to said plate at the rear end thereof, is mounted upon the left-hand side of the lever, its outer or free end being penetrated by a pin *b*, which projects through the key-lever. The plate is adapted to slide on the pin *b* at its outer end, and its pin *a* may slide in the key-lever, so that the plate is rendered capable of lateral movement to and from the lever. To guide the pin *a* so that the parts will not bind

in moving, a short sleeve 5, surrounding the free end of said pin, is formed integrally with the key-lever on its right-hand side. At the rear end and upon the upper edge of the plate a block 6, having an inclined rear face, is integrally formed with said plate and projects over the top of the key-lever.

Pivoted to the free end of the pin *a* is a short lever 7, fulcrumed near its center to move in an approximately horizontal plane in a stem 8, which projects from the right-hand side of the key-lever. Said lever 7 has an upwardly-projecting flat arm 9, which is arranged obliquely to the direction of the length of the lever. A slot *a'*, arranged in the pivoted end of the lever 7, permits free movement of said lever on the pin *a*.

It may be here remarked that the usual pin for setting the transfer mechanism in such an operative position that through a portion thereof the carrying-over operation may be performed is provided on the left-hand side of each of the adding-wheels except the one of the highest order. This pin (indicated by the letter *c* in the drawings) is adapted to come into contact with the outer face of the arm 9, and in order to facilitate the easy working of said pin against the arm the former is beveled at its free end, so as to present an inclined surface to the obliquely-set arm.

In turning the pin *a* in the forming-lathe it is shaped substantially as shown in the drawings—*i. e.*, it is provided about midway with a pair of V-shaped depressions. With each of these depressions the free end of a spring-steel wire 10 engages, said wire being secured at one of its ends to the pin *b* and bent around a stud *d* on the lever at its other end. To admit the free end of the spring into contact with the pin, so as to engage its depressions, I cut a slot *e* in the sleeves 5. By the arrangement just referred to the pin and all of the movable parts with which it is connected are adapted to be held at either of the two limits of their joint movements.

Over the key-lever and having bearings in the side pieces of the frame of the machine is a shaft 11. Said shaft is provided with cams 12 and 13, formed integrally on sleeves 14, carried by the shaft and arranged opposite to the blocks 6 on the plates 4. The cams 12 are adapted to wipe on the inclined faces of the blocks and the cams 13 on the sides of said blocks nearer the key-levers. Hence the wiping-faces of the former are so cut as to impart a movement at right angles to the shaft 11, and the wiping-faces of the latter are so cut as to impart a movement in the direction of the length of said shaft. The shaft 11 has operative connection through pinions 15, 16, and 17 with the main shaft B, which is operated by the crank Y.

The operation of this mechanism may be described as follows: Assuming that the adding-wheel of lower order in a given pair has not completed a full revolution, the parts are in the position indicated in the drawings, Fig. 3. The said wheel is actuated by its lever until such revolution has been completed, whereupon the pin carried by said wheel strikes against the lever 7, which through pin *a* draws to the side of the key-lever the plate 4, carrying block 6, which takes a position over the top of the said key-levers, the parts assuming positions similar to those which the corresponding elements of the right-hand lever are shown as occupying in said Fig. 3. Said block is now directly in the paths of the cams 12 and 13, so that when the machine is reset by means of the crank Y and the shaft B, to which said crank is connected, said cams successively depress and throw away from the side of the key-lever the block 6, carried by the plate 4. A depression of the block of course produces a consequent depression of the key-lever to which it is connected, so that by this means the carrying-over operation is concluded when said key-lever has thus been made to effect one escapement of its adding-wheel. Owing to the peculiar shape of the pin and the wire spring which bears against it the movable parts of the mechanism carried by the lever will remain in the position which they were above stated to have last assumed until upon another revolution of the adjoining adding-wheel the pin thereon further actuates them.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a transfer mechanism for a pair of counting devices of a cash-register, the combination, with means for actuating the key-lever of one of said devices, of a suitable laterally-reciprocating block carried by, and adapted to transmit power to, said key-lever directly from the actuating means toward its adjoining face, said adjoining face being adapted to receive the actuating force and said block being operatively connected with and adapted to be set in operative relation to said lever by the other of said devices, substantially as described.

2. In a transfer mechanism for a pair of counting-wheels of a cash-register, the combination, with means for actuating the key-lever of one of said wheels, of a laterally-reciprocating plate carried by said key-lever, a lever fulcrumed in said key-lever and operatively connecting said plate with the other of said wheels, and a block carried by said plate and adapted to transmit power to said key-lever from the actuating means toward its adjoining face, said face being adapted to receive the actuating force, substantially as described.

3. In a transfer mechanism for a pair of counting-wheels of a cash-register, the combination, with means for actuating the key-lever of one of said wheels, of a laterally-reciprocating plate carried by said key-lever, a lever fulcrumed in said key-lever and operatively connecting said plate with the other of said wheels, and a block integrally formed

with said plate, projecting over said key-lever and adapted to transmit power to said key-lever from the actuating means toward its adjoining face, said adjoining face being adapted to receive the actuating force, substantially as described.

4. In a transfer mechanism for a pair of counting-wheels of a cash-register, the combination, with means for actuating the key-lever of one of said wheels, of a laterally-reciprocating plate carried by said key-lever, a lever fulcrumed in said key-lever provided with an upwardly-extending arm at its rear end and connected with the plate at its forward end, a pin projecting laterally from the other of said wheels and adapted to engage the arm, and a block integrally formed with said plate, projecting over said key-lever, and adapted to transmit power to said key-lever from the actuating means toward its adjoining face, said adjoining face being adapted to receive the actuating force, substantially as described.

5. In a transfer mechanism for a pair of counting-wheels of a cash-register, the combination, with means for actuating the key-lever of one of said wheels, of a laterally-reciprocating plate carried by said key-lever, a lever fulcrumed in said key-lever provided with an upwardly-extending and obliquely-set arm at its rear end and connected with the plate at its forward end, a pin having a bevel end projecting laterally from the other of said wheels and adapted to engage the arm, and a block integrally formed with said plate, projecting over said key-lever, and adapted to transmit power to said key-lever from the actuating means toward its adjoining face, said adjoining face being adapted to receive the actuating force, substantially as described.

6. In a transfer mechanism for a pair of counting-wheels, the combination with a key-lever for the one of said wheels and operating means for said key-lever, of a pin *b* projecting from the side of said key-lever, a laterally-movable plate carried by the key-lever, penetrated by the pin *b* and provided with a laterally-projecting pin *a* penetrating said key-lever, means for retaining said plate at either of the limits of its movements, a lever fulcrumed in the key-lever, provided with an upwardly-extending and obliquely-set arm at its rear end and connected with the pin *a* at its forward end, a pin having a beveled end projecting laterally from the other of said wheels and adapted to engage said arm, and a block integrally formed with said plate and projecting over the key-lever, and adapted to serve as an intermediate power-transmitting element between the operating means and the key-lever in the plane of the movement of the body of said key-lever, substantially as described.

7. In a transfer mechanism for a pair of counting-wheels, the combination with a key-lever for the one of said wheels, and means for operating said key-lever, of a pin *b* projecting from the side of said key-lever, a slotted sleeve projecting from the other side of said key-lever, a plate penetrated by and laterally movable on said pin *b* and provided with a pin *a* projecting through the key-lever and the sleeve, said pin *a* having depressions adapted to register with the slot in the sleeve at the limits of the movements of said pin, a spring arranged in said slot in the sleeve, adapted to engage the depressions and secured to the key-lever, a lever fulcrumed in the key-lever, provided with an upwardly-extending and obliquely-set arm at its rear end and connected with the pin *a* at its forward end, a pin having a beveled end projecting laterally from the other of said wheels and adapted to engage said arm, and a block integrally formed with said plate and projecting over the key-lever, and adapted to serve as an intermediate power-transmitting element between the operating means and the key-lever in the plane of the movement of the body of said key-lever, substantially as described.

8. In a transfer mechanism for a pair of counting-wheels of a cash-register, an operating key-lever for the one of said wheels, a block carried by said key-lever and adapted to be moved by the other of said indicators to a position over said key-lever, and means for actuating said key-lever through said block in the plane of the movement of the body of said key-lever, the face of said lever adjacent the block being adapted to receive the actuating force, substantially as described.

9. In a transfer mechanism for a pair of counting-wheels of a cash-register, an operating key-lever for the one of said wheels, a power-transmitting block carried by said key-lever and adapted to be moved by the other of said wheels into operative position over said key-lever, a shaft provided with a cam adapted to transmit power to said key-lever through said block in the plane of the movement of the body of said key-lever, and means for operating said shaft, the face of said lever adjacent the block being adapted to receive the actuating force, substantially as described.

10. In a transfer mechanism for a pair of counting-wheels of a cash-register, an operating key-lever for the one of said wheels, a power-transmitting block carried by said key-lever and adapted to be moved by the other of said wheels to an operative position over said key-lever, a shaft provided with cams the one of which is adapted to transmit power to said key-lever through said block in the plane of the movement of the body of said key-lever and the other of which is adapted to return said block to its initial position, and means for operating said shaft, substantially as described.

11. In a transfer mechanism for a pair of counting-wheels of a cash-register, an operating key-lever for the one of said wheels, a

power-transmitting block carried by said key-lever and adapted to be moved by the other of said wheels into operative position over said key-lever and provided with an inclined face, a shaft provided with cams the one of which is adapted to wipe on the inclined face of said block and transmit power to said key-lever through said block in the plane of the movement of the body of said key-lever, and the other of which is adapted to return said block to its initial position, and means for operating said shaft, substantially as described.

12. In a cash-register, the combination with the frame, of a system of counting-wheels, operating key-levers therefor, a series of power-transmitting elements carried by the key-levers and each adapted to be thrown into operative position by the adjoining wheel of lower order, and a shaft having a suitable operating means and provided with pairs of cams arranged to successively actuate said series of elements, one of the cams in each of said pairs being adapted to transmit power in a vertical direction to the corresponding key-lever through its respective element, and the other of said cams being adapted to return said series of elements to their initial positions, substantially as described.

13. In a transfer mechanism for a pair of counting-wheels for a cash-register, the combination with the key-lever for the one of said wheels, of a laterally-movable power-transmitting element carried by, and adapted to be moved into and out of operative position relatively to, said lever and means for retaining said element at the limits of its movement consisting of a pin carried thereby, projecting through the key-lever and provided with depressions, and a spring secured to said key-lever and adapted to engage said depressions, substantially as described.

14. In a transfer mechanism for a pair of counting-wheels for a cash-register, the combination with the key-lever for the one of said wheels and a pin projecting laterally therefrom, of a laterally-movable power-transmitting element carried by said pin and adapted to be moved into and out of operative position relatively to said lever, and suitable means for retaining said element at the limits of its movement consisting of a pin carried thereby, projecting through the key-lever, and provided with depressions, and a spring secured to said key-lever and adapted to engage said depressions, substantially as described.

15. The combination in a transfer mechanism for a pair of counting-wheels for a cash-register of a key-lever for one of said indicators, a pin projecting laterally from said key-lever, a laterally-reciprocating plate mounted on said pin and provided with a pin *a* penetrating and loosely arranged in said key-lever, a block integrally formed with said plate and movable with the same into a position over the key-lever, a lever fulcrumed on said key-lever and connected with a pin *a* at one of its ends and adapted to be actuated by the other wheel at the other of its ends, a transversely-slotted sleeve secured to said key-lever and also penetrated by the pin *a*, said pin *a* being provided with depressions one of which registers with the slot in said sleeve at each of the limits of movement of said pin, a spring secured to said key-lever and projecting into said slot and against said pin *a*, and means for operating said key-lever through said block, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 11th day of August, 1897.

ALBERT LATHAM.

In presence of—

ANDREW E. NIELSEN,

G. H. HUNTINGTON.