(No Model.) 2 Sheets—Sheet 1.

J. F. PFEFFER.

CASH INDICATOR AND REGISTER.

No. 422,827. Patented Mar. 4, 1890.

Fig. 5

Fig. 1

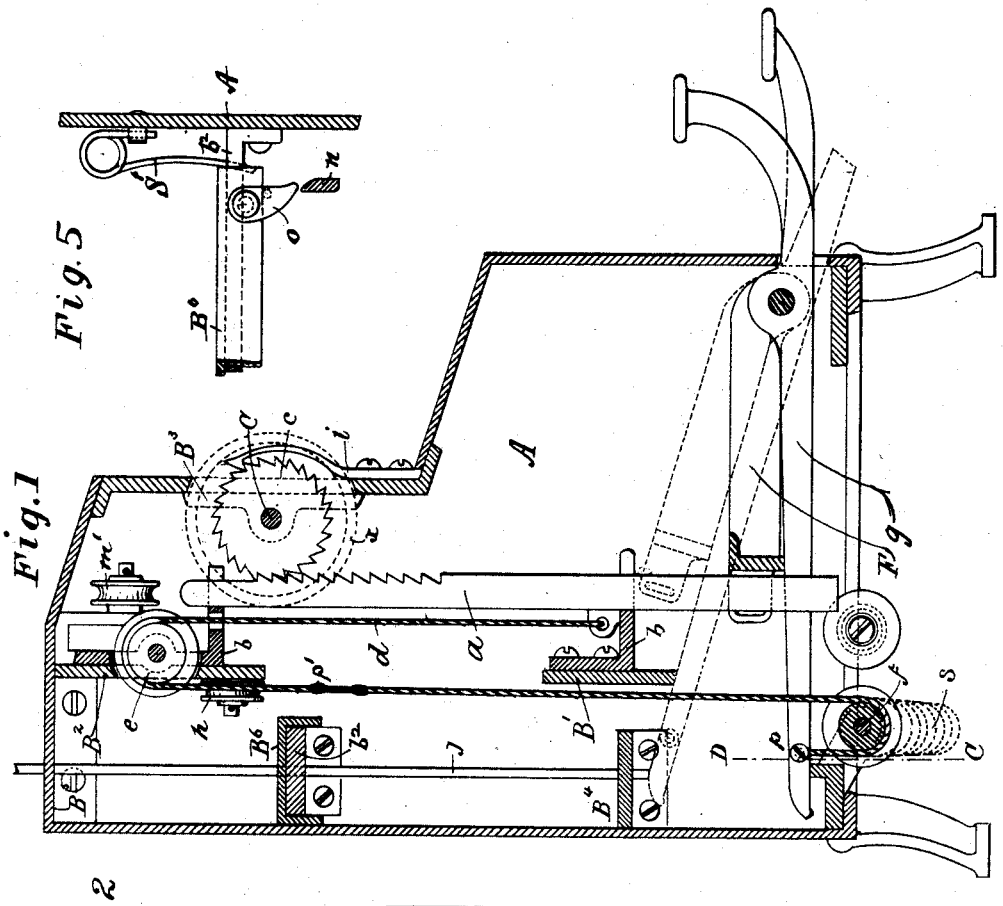
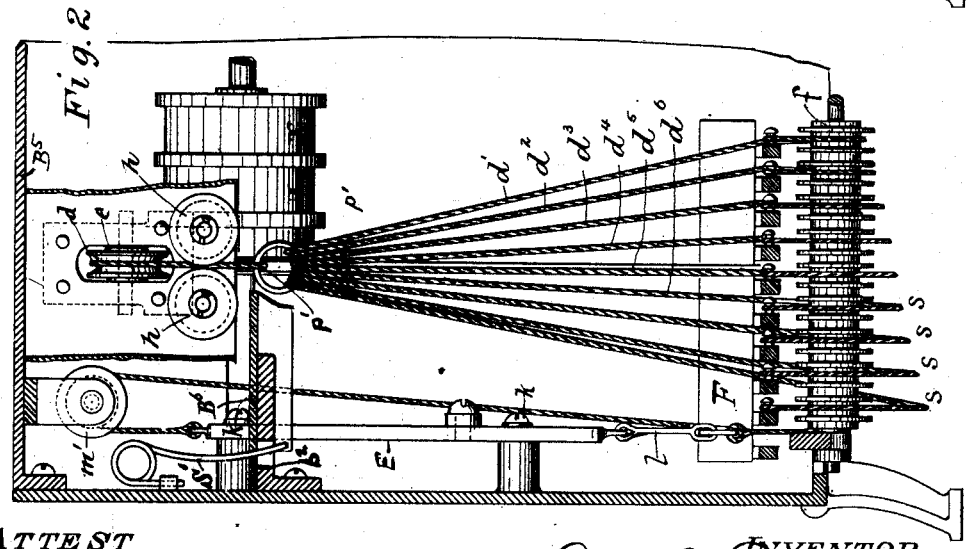


Fig. 2



ATTEST

Wm. L. Hosea

Ella Hosea.

INVENTOR

John J. Pfeffer

by R. L. Hosea ATT'Y

(No Model.) 2 Sheets—Sheet 2.

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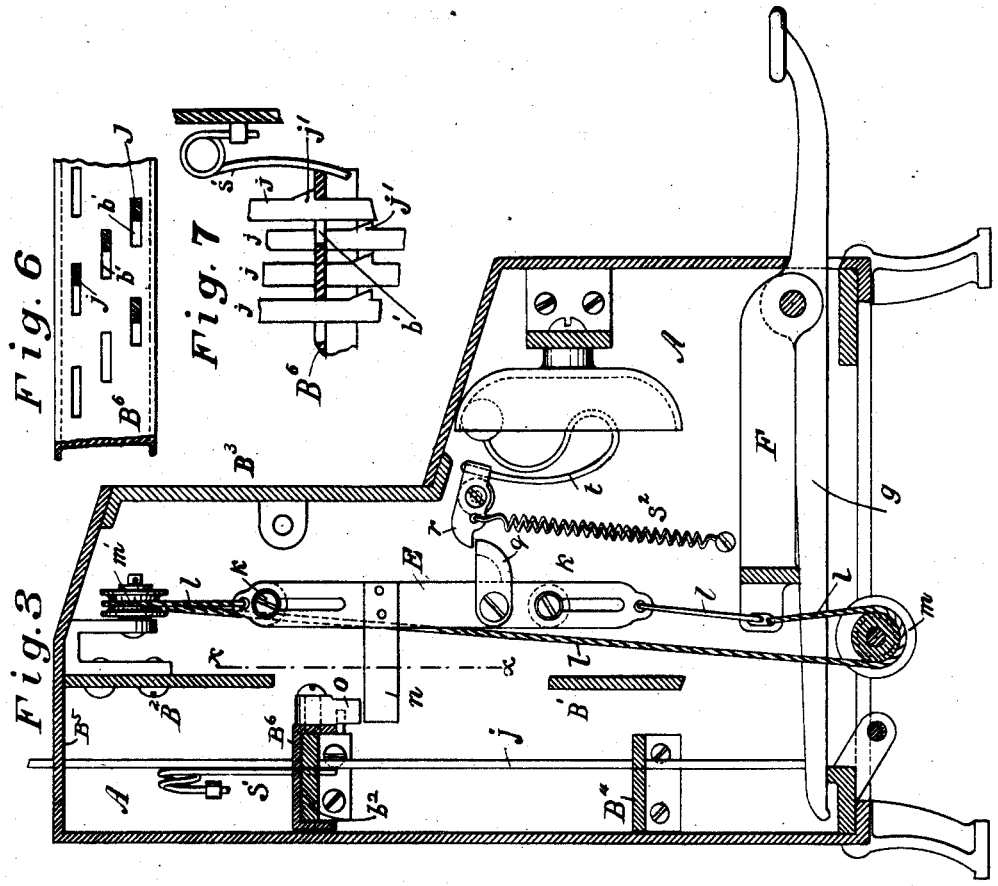

Fig. 6

Fig. 7

Fig. 3

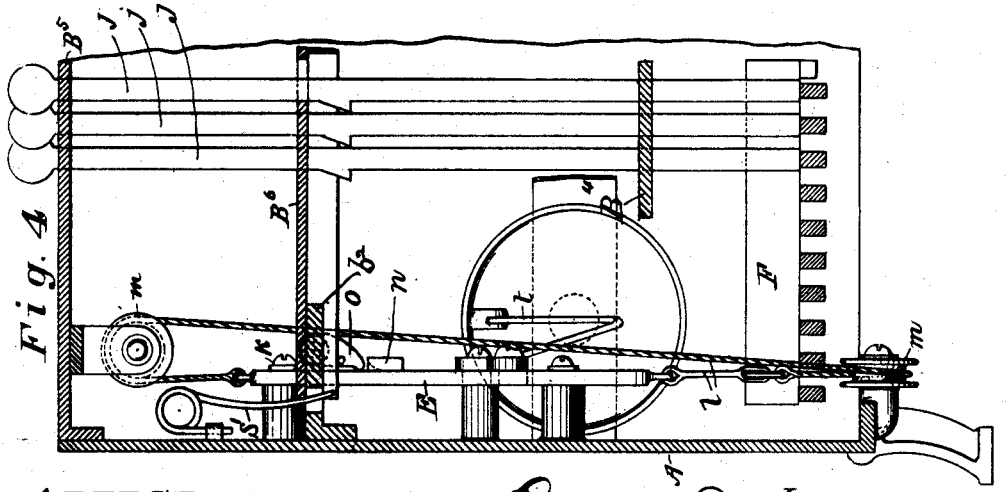

Fig. 4

ATTEST

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UNITED STATES PATENT OFFICE.

JOHN F. PFEFFER, OF CINCINNATI, OHIO.

CASH INDICATOR AND REGISTER.

SPECIFICATION forming part of Letters Patent No. 422,827, dated March 4, 1890.

Application filed June 1, 1889. Serial No. 312,903. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. PFEFFER, a citizen of the United States, residing at Cincinnati, Ohio, have invented new and useful Improvements in Cash-Registers, of which the following is a specification.

My invention relates to "cash-registers," its object generally being to simplify the construction of the same in respect to their main principles of operation, to which end it consists, first, in the construction of the same with reference to the means employed for selective actuation of the indicating-rolls by the keys—that is to say, in combining with the keys and the registering-rolls a rack-and-pinion device actuated by a series of cords or chains of graduated length attached to and operated by the several keys. The keys being constructed and arranged to produce a uniform oscillating sweep of their arms, their controlling effect upon the rack-bar depends upon the relative length of the cord or chain connection. These lengths being properly graduated, each full sweep of a lever produces its appropriate and predetermined quantum of rotation of the registering-rolls.

My invention also consists, secondly, in improvements in the means for actuating and controlling the signals or indicators, and also of the signal-bell, all as more fully hereinafter described.

Mechanism embodying my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a cross-section of a cash-register frame in which my improvement is applied, showing in elevation the rack-bar, a key, and one of the chain or cord connections, also showing one of the indicators in its raised position. Fig. 2 is a partial rear view of the frame, showing one set of cord or chain connections of graduated length as attached to and operated by one group of keys, and giving also a rear view of part of the indicator mechanism to show the general relation of parts; Fig. 3, a cross-section in a plane parallel and adjacent to that of Fig. 1 beyond the roll-actuating mechanism, showing in elevation the indicator and bell-actuating mechanism; Fig. 4, a rear view of the machine, showing the indicator and bell mechanism and omitting the roll-actuating mechanism; Fig. 5, a detail front view of part of the retaining or "tablet" plate with its retracting-spring and pivoted cam, showing the relation of parts; Figs. 6 and 7, a detail plan and elevation of a portion of the tablet-plate, showing the mode of engagement of the indicator rods or standards.

Referring now to the drawings, it should be stated that inasmuch as the general character and construction of cash-registers of this type are well known I have shown herein only so much of the structure as illustrates my invention applied to a single group of keys—as, for example, the cent-units, from one to nine.

A in the drawings designates one side or end of the machine, and B′ B^2 B^3 permanent cross-braces uniting the two sides or ends and furnishing supports for certain parts of the mechanism, as hereinafter set forth.

C designates the common shaft of the register-rolls *x*, carried in bearings attached to the cross-brace B^3, and *c* the ratchet-wheel, by which the initial movement is given, the register-rolls being adjacent and connected in the usual manner to operate one upon the other at certain intervals. Placed in engaging contact with the ratchet *c* is a rack-bar *a* vertically mounted in guides *b b*, attached to the cross-bars B′ B^2, respectively, and suspended against its gravity by a chain or cord *d*. The chain or cord *d* passes upward over an idler-sheave *e*, mounted in bearings upon the cross-brace B^2, thence downward around one of a series of similar idlers *f*, mounted upon a shaft near the bottom of the frame, and thence upward to a terminal fastening *p* upon one of the keys *g*. If, now, the chain be of such length as to be held taut upon the idler-sheaves in the position shown in Fig. 1, the full movement of the lever *g* will operate the rack-bar *a* to its full limit of movement, and consequently will operate the ratchet-wheel *c* through the maximum predetermined arc of rotation. The chain *d* is, however, divided into a number of branches *d′* d^2, &c., all merging and connecting at the point *p′* with the chain *d* and passing downward around their several idler-sheaves *f* to engage each its appropriate manipulating-key. Each of these chains after

the first is of increased length in definite proportion through the series, leaving a definite amount of slack. (Indicated by dotted lines *s* in Fig. 1 and in full lines in Fig. 2.) By this means the initial travel of the end of the keys after the first is consumed in taking up the slack of the chain before acting upon the rack-bar. These lengths being properly graded, the result is that the key having the greatest length of chain attached moves the register-ratchet *c* one unit of rotation, and the key having attached the taut chain without slack moves the ratchet, as above stated, the maximum number of units, while the intervening connections complete the series of movements.

A convenient mode of construction is to make the chain of links of given length and omit or add a link to each adjacent branch. To insure proper guidance, I carry the main chain between lateral guide-sheaves *h h*, secured to the back of the brace B^2.

As here shown, the rack-bar holds the short chain taut by its weight alone, and, being upheld by a connection at its rear, its gravity also causes it to retain its actuating-connection with the ratchet *c;* but springs may be introduced, if desired, to insure due engagement. A spring-catch or detent-pawl *i* is attached to the frame, bearing upon the ratchet to prevent backlash and as a brake to prevent over-registration.

The indicator mechanism is constructed as follows: The standards or indicator-rods *j*, Figs. 3 and 4, rest upon the ends of the keys *g* and are guided in slots in cross-braces B^4 B^5 to move vertically. Between the braces B^4 B^5 is a sliding bar B^6, moving upon guiding-brackets b^2, secured to the frame and having somewhat elongated slots *b'*, through which the standards *j* pass. The sliding bar B^6 is normally held at one limit of its movement by a spring S', attached to the frame, in order that when an indicator-rod *j* is forced upward the plate B^6 will yield longitudinally in position sufficiently to permit the ratchet-toothed projection *j'* of the rod to pass through the elongated slot *b'*, and the plate being then forced back to its original position by the resiliency of its spring S' beneath the projection *j'* the rod is retained in its elevated position, as indicated in Fig. 7. The general function in this regard in machines of this class is that of retaining the indicator elevated until the next key is struck, and in order to insure the proper fall of the indicator I introduce the following mechanism for the purpose of operating the bar B^6 independently of the rod *j*. I arrange a slotted bar E to slide vertically on guide-screws *k* and connect its lower end by a cord or link *l* with a weight-yoke F, pivoted concentrically with the keys *g* and resting upon them. The cord *l* passes thence beneath an idler-sheave *m*, pivoted at the bottom of the frame, and upward over a similar idler *m'*, pivoted near the top of the frame, and thence attaching to the top of the bar E, by which means the movement of any of the keys elevates the bar E. Upon the bar E is a lateral cam-finger *n*, set to engage a pivoted cam *o*, attached to the inner side of the sliding plate B^6. The form and relation of these parts will be clearly understood by reference to Figs. 3 and 5, the cam *o* being of such form as to hang by gravity with its point beyond the vertical path of the finger *n*, yet adapted to swing aside to allow the finger to pass by in its descent.

The action of the parts is as follows: The key being struck and one indicator-rod being elevated, the finger *n* engages the cam *o* and shoves the plate B^6 longitudinally far enough to allow the last previously-elevated indicator-rod to drop back to its original position, while at the same time, as the finger *n* passes above the cam *o*, the spring S' returns the plate B^6 to its former position and engages beneath the projection *j'* of the indicator-rod just elevated, and holds it in its elevated position independently of the keys, as indicated in Fig. 7. The sliding bar E also serves to actuate the striker of the bell, to which end a projecting finger *q* is placed upon the bar E to engage a pivoted head *r*, to which the hammer-arm *t* is attached. The upward movement of the bar E causes the finger *q* to engage beneath the pivoted head *r* and raise it against the force of a resisting-spring S^2 and sounds the bell in the ordinary manner.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. In a cash-register of the type indicated, the combination of a ratchet for actuating the register-rolls, a rack-bar for actuating the ratchet, and a series of chains or cords of graduated length connecting with the registering-keys and the rack-bar, substantially as and for the purpose set forth.

2. In a cash-register of the type indicated, the combination of a ratchet-wheel upon the register-roll shaft, a reciprocating rack-bar engaging the same, the indicating-keys, and a series of cords or chains of graduated length connected at one end with the key-levers and merging into a common connection with the rack-bar, substantially as specified.

3. The combination and arrangement, in a cash-register of the type indicated, of the register-rolls, the ratchet-wheel, the reciprocating rack-bar, the key-levers, the cords or chains of graduated length connected therewith, the lower series of idler-sheave, the common connecting chain or cord, and the upper idler-sheave, substantially as set forth.

4. In a cash-register of the type indicated, having, in connection with the series of keys, a series of visible indicators upon standards or rods actuated by the keys, the spring-retracted slotted holding-plate provided with a cam, the vertically-sliding actuating-bar having a cam-finger adapted to engage said cam and actuate said holding-plate in the direct action of the sliding bar and to pass the same without engagement with the reverse move-

ment, and a connection between the keys and said bar, whereby the keys are caused to move the holding-plate independently of the indicator-rods, substantially as set forth.

5. The combination and arrangement of the slotted spring-retracted holding-plate, the indicator-rods provided with retaining lugs or projections, the cam-fingered actuating-bar, the concentric pivoted weight-yoke, the keys, and the cord or chain connection between the yoke and the actuating-bar, whereby the movement of any key throws up its indicator and drops that already up, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN F. PFEFFER.

Witnesses:
L. M. HOSEA,
E. R. DONOHUE.