

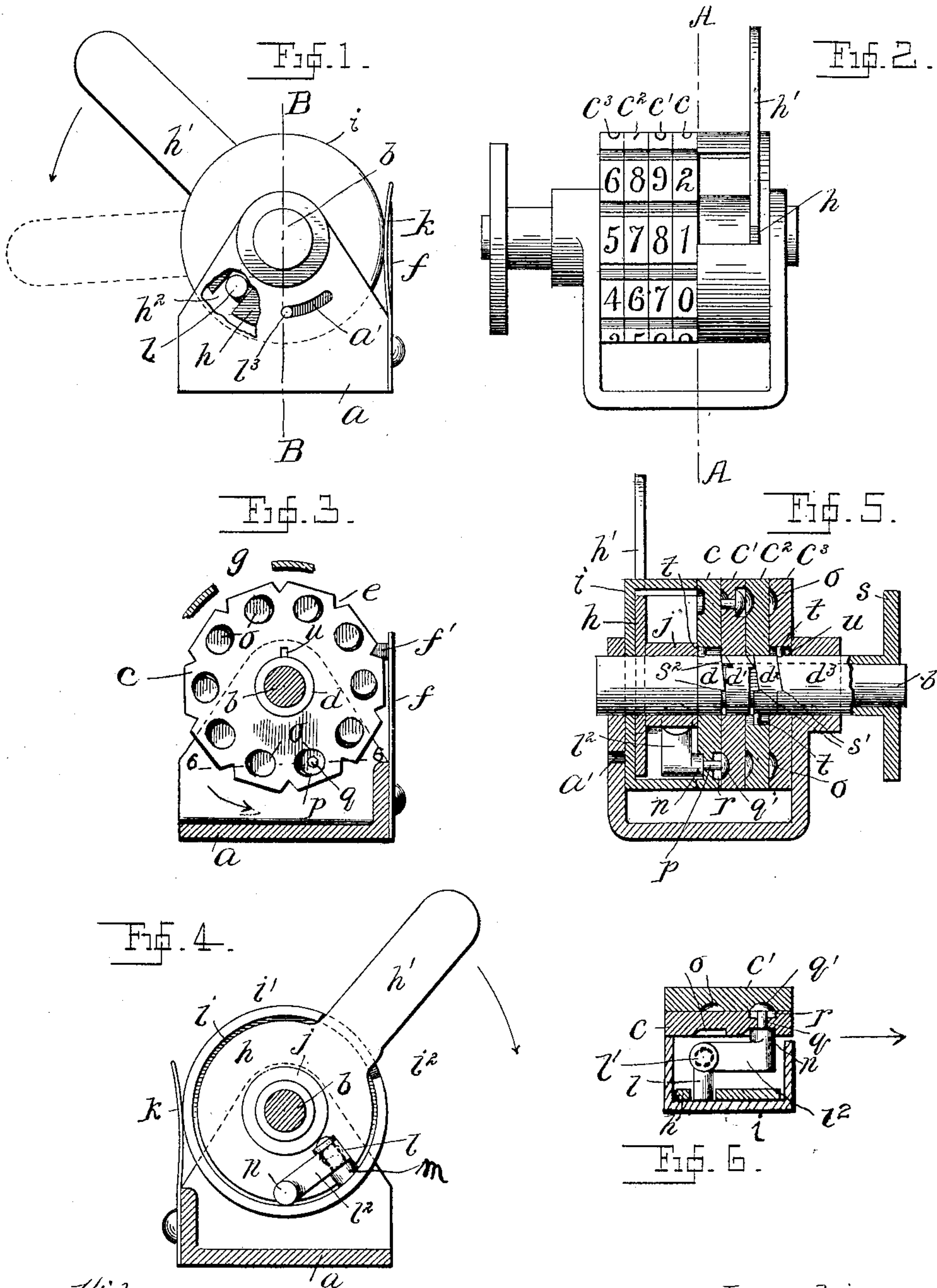
No. 672,185.

Patented Apr. 16, 1901.

I. S. DEMENT.
COUNTER.

(Application filed Mar. 8, 1900.)

(No Model.)



Witnesses.
Wm. A. Courtland
J. Green.

Inventor:
Isaac S. Dement
by *Thos. J. Dement*
Att'y.

UNITED STATES PATENT OFFICE.

ISAAC S. DEMENT, OF CHICAGO, ILLINOIS.

COUNTER.

SPECIFICATION forming part of Letters Patent No. 672,185, dated April 16, 1901.

Application filed March 8, 1900. Serial No. 7,914. (No model.)

To all whom it may concern:

Be it known that I, ISAAC S. DEMENT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Counters, of which the following is a specification.

This invention relates to improvements in counters such as are used in connection with registers or other devices to count and indicate the number of times a certain operation has been performed.

My invention relates particularly to the improved construction of the mechanism for enabling "accumulation" of the count from each wheel to the next higher wheel of the counter, and the invention also comprises improvements in the resetting means.

The improved counter comprises, in connection with the actuator or "count" and a series of numeral-wheels, connecting or accumulating devices between the successive wheels normally inoperative, but brought into operation in a definite position of the preceding members of the counter to cause the counting motion of such preceding members to be transmitted to the next higher member. In connection with such normally inoperative connections between the several numeral-wheels the invention comprises resetting means consisting of parts which are in engagement with the numeral-wheels and are normally disengaged from one another, so as to enable free relative movement of the wheels in counting, but are capable of being brought into engagement with one another and with a resetting device to enable resetting of the numeral-wheels.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is an end view of a counter embodying my invention, partly broken away to show an interior part. Fig. 2 is a side elevation of same. Fig. 3 is a section on the line A A in Fig. 2 looking toward the left. Fig. 4 is a section on the line A A in Fig. 2 looking toward the right. Fig. 5 is a longitudinal section of the counter on the line B B in Fig. 1. Fig. 6 is a detail sectional view of portions of two numeral-wheels, the actuating device, and the connecting mechanism on the line 6 6, Fig. 3.

The mechanism of the counter is supported

in a suitable frame *a*, carrying a shaft or spindle *b*, on which the several numeral-wheels *c c' c² c³* are supported in such manner as to be free to move rotatively, but are restrained from longitudinal movement, sleeves *d d' d² d³* being interposed between the spindle *b* and the several numeral-wheels, as hereinafter described. Each numeral-wheel *c c'*, &c., is provided on its periphery with a series of facets numbered from "0" to "9" and with notches *e* between said facets engaging with wedges *f'* on leaf-springs *f*, which hold the respective numeral-wheels in exact angular position and prevent accidental displacement. The digits on the respective facets of the numeral-wheel appear through a suitable opening in the inclosing case (indicated at *g* in Fig. 3) in the usual manner when in register with said hole, so as to give a sight-reading of the amount indicated by the counter.

At one end of the series of numeral-wheels is the count or actuator *h*, here represented as a disk rotatably mounted on the spindle *b* and provided with an arm *h'*, the vibrations or strokes of which are to be counted. This arm may be connected to a register or to any other device the number of whose operations is to be counted. Surrounding the disk *h* is a disk *i*, also loosely mounted in the spindle *b* and having a peripheral laterally-projecting flange *i'*, with an opening at *i²*, where the arm *h'* projects through, this opening being sufficiently wide to permit the said arm to have a certain amount of lost motion or free relative rotative movement within said opening. A leaf-spring *k*, bearing on the periphery of disk *i*, opposes a slight frictional resistance to the rotative movement of the said disk *i*, so that as the actuator-arm *h'* is moved in one direction or the other it does not begin to move the disk *i* until the said arm strikes the end of the slot or opening *i²*. The disk *i* is held in place longitudinally by a collar *j*, interposed between it and the first or units wheel *c*. The rotating movement of the disk *i* may be limited by a pin *i³* thereon engaging in a slot *a'* in the frame *a*.

A notch *h²* in the disk *h* engages with one arm *l* of a bent lever pivoted at *l'* to a lug *m*, extending inwardly from flange *i'*, the other arm *l²* of said lever having a nose, pin, or pawl *n* extending toward the units-wheel and

adapted when pressed toward the units-wheel to engage in any one of a series of ten pockets or catch-depressions *o* in the side of said wheel. One of these depressions has a central hole *p*, extending clear through the units numeral-wheel, and in this hole slides a pin *q*, provided with a rounded head *q'*, which occupies a countersink *r* in the opposite side of the numeral-wheel and is adapted when the said pin is pressed toward the tens-wheel *c'* to engage in one of a series of ten depressions in the side of said tens-wheel. Similarly the tens-wheel has a sliding pin *q* in one of its depressions provided with a rounded head adapted to engage the hundreds-wheel, and so on for the successive wheels until the last wheel in the case *c*³ is reached, this last wheel having only the pockets *p* without any sliding pin. The total length of each pin *q*, with its head *q'*, is just equal to the thickness of the corresponding numeral-wheel, so that each pin-head when pushed fully in is completely within the wheel, and the wheels are thus free of one another, and the heads and depressions being rounded it is apparent that any relative movement of the wheels will tend to push the heads inward and release the wheels from one another unless the corresponding pin is held from endwise movement. It is preferable, however, to make the forward faces of the depressions in the units-wheel straight, as shown in Fig. 6, so as to enable the lever pin or pawl *n* to more easily retain its engagement therewith.

The resetting mechanism comprises the sleeves *d d' d² d³* aforesaid, the last of which carries a head or flange *s*, by which it may be turned. The adjacent ends or faces of these sleeves have corresponding ratchet-shaped teeth *s'* and depressions *s²*, inclined on one face and abrupt on the other, so that any movement of the main resetting-sleeve *d³* in the direction for resetting will carry the others with it. Each sleeve *d d'*, &c., carries a pin *t*, engaging in a slot or slit *u*, extending longitudinally through the corresponding numeral-wheel, so that the rotation of any one of the said sleeves causes rotation of the corresponding numeral-wheel, while longitudinal movement of the sleeve relatively to the wheel is permitted.

The operation of the counter is as follows: Each movement of the count or arm *h'* in the direction of the arrow in Figs. 1 and 4 will first, by the engagement of notch *h²* with the lever-arm *l*, engage the pawl *n* of said lever in that one of the depressions in the units-wheel which is for the time being opposite said pawl, the lost motion or limited amount of free relative movement between the arm *h'* and the disk *i* enabling such operation of the pawl-lever *ll' n* to be effected before the arm *h'*, by striking the end of slot *i²*, causes the disk *i*, with the pawl-lever and the actuator, to turn as a whole in the further rotation of the actuator. In such further rotation the units-wheel will participate on account of

the engagement of the pawl *n* in a depression *o* of said wheel, and the units-wheel will thereby be advanced one notch. In the return movement of the actuator *h h'* the first effect will be to withdraw the pawl *n* from the units-wheel, and then the actuator, together with the disk *i* and the lever *ll' n*, carried thereby, will move back to the initial position. Successive operations of the actuator will produce similar progressive movements of the units-wheel, without, however, affecting the other numeral-wheels until the numeral "9" on the units-wheel comes into register, at which time the accumulating or connecting pin *q* in the units-wheel comes opposite the pawl *n*, when the actuator is retracted. Then on the next stroke of the actuator the lateral movement of the pin or pawl *n* will drive the pin *q* endwise and cause its head *q'* to project from the other side of the units-wheel and engage in the depression in the tens-wheel that happens to be opposite it, thus locking the tens and the units wheels together, so that the completion of the actuator's stroke will cause progression of both units and tens wheels one step. On the retracting movement of the actuator the pawl *n* is disengaged, as before, and in its next stroke it strikes the depression next to the one with a pin and leaves the pin free, so that as the units-wheel is turned and movement of the tens-wheel is resisted by its snap-spring *f* the pin is forced back to its original position by the engagement of its rounded head with the rounded depression, leaving the wheels free, as before. Each wheel thus accumulates from the next lower wheel in similar manner, the highest wheel of course needing no connecting-pin.

To reset the counter, the resetting-head *s* is turned in the direction of the arrow in Figs. 1 and 4 and the head is pressed gently inward at the same time, so as to cause engagement of the toothed and notched ends of the sleeves *d³ d² d' d*. The sleeve *d³* will then successively "gather" the several sleeves *d² d' d* and the connected numeral-wheels *c² c' c*, and as the numeral-wheel *c³* is always in direct rotative connection with the sleeve *d³* it follows that after a certain rotative movement of the head *s* the numeral-wheels will all be in connection with the said head and they will all be brought to rest at a zero-reading through the right opening, it being understood that the several pins *t* on the respective sleeves are so arranged with respect to the teeth or notches on said sleeves that when all the numeral-wheels are caught or gathered, as described, they will all present the same numerals through the register-opening.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a counter, the combination with an actuating device and a plurality of numeral-wheels, of means for actuating each wheel accumulatively from the preceding wheels and from the actuating device, consisting of a

pawl device carried by the actuator and operating the first numeral-wheel, and connecting means carried by succeeding numeral-wheels, normally in disengaged relation, but adapted, by engagement with the said pawl device and with one another, to be brought into engagement with the next higher wheel.

2. In a counter, the combination with a plurality of numeral-wheels, of an actuating device, a connecting pawl-lever carried by said actuating device and adapted to engage with the first numeral-wheel in one direction of movement, but to allow free movement in the opposite direction, and a connecting-pin carried by the first numeral-wheel and normally allowing free movement of the first numeral-wheel relatively to the second numeral-wheel, but arranged to be engaged by said pawl-lever, in a definite position of the first numeral-wheel and to be thereby brought into engagement with the second numeral-wheel.

3. In a counter, the combination with a plurality of numeral-wheels, each having a series of catch-depressions, of an actuating device, and a pawl-lever carried thereby and adapted to engage the catch-depressions of the first wheel in one direction of movement, and a pin in one of the depressions of the first numeral-wheel adapted to be engaged by said pawl-lever so as to be forced into engagement with a catch-depression in the second numeral-wheel.

4. In a counter, the combination with an actuating device, of a plurality of numeral-wheels, each having a series of catch-depressions and provided with means for resisting its rotative movement, and means for causing each numeral-wheel to be operated accumulatively from the preceding numeral-wheels and from the actuating device, such means consisting of a connecting-pin carried by and contained in each of the actuating numeral-wheels and adapted to slide with the wheel into and out of engagement with the catch-depressions in the next higher numeral-wheel, and a pawl-lever carried by the actuating device and adapted to engage the catch-depressions of the first numeral-wheel, and the connecting-pins of each actuating-wheel being adapted, in a definite position of the containing-wheel, to be actuated respectively by the pawl-lever on the connecting-pin of the preceding numeral-wheel, so as to be brought into engagement with the next succeeding wheel.

5. In a counter, the combination of a series of numeral-wheels each having a series of catch-depressions, and a connecting-pin slid-

ably arranged in one of the catch-depressions of each wheel and having a rounded head adapted to be engaged, by forcible lateral movement with the catch-depressions of the next higher wheel, but by reason of its rounded head to free itself from such engagement on relative rotative movement of the wheels, and an actuating device engaging with the depressions and the connecting-pin of the first numeral-wheel.

6. In a counter, the combination with a numeral-wheel having a series of depressions, of an actuating device comprising a vibratory support, a vibratory actuating member having a limited amount of free rotative movement relative to said support, a pawl-lever pivoted to said support and engaged by said actuating member, so as to be brought into engagement with a depression in the said numeral-wheel and a spring bearing on said vibratory support and resisting its movement in either direction.

7. In a counter the combination with a spindle, a numeral-wheel having a series of depressions, of an actuating device comprising a vibratory support loosely mounted upon said spindle, a vibratory actuating member having a limited amount of free rotative movement relative to said support a pawl-lever pivoted to said support and engaged by said actuating member, so as to be brought into direct engagement with a depression in the said numeral-wheel and a spring bearing on said vibratory support and resisting its movement in either direction.

8. In a counter, the combination with a plurality of numeral-wheels and normally-disengaged connecting means therefor, of resetting means comprising sleeves engaging with one another by a ratchet-tooth connection and with the respective numeral-wheels by a connection permitting relative longitudinal movement but transmitting rotative movement.

9. In a counter, the combination with a plurality of numeral-wheels and normally-disengaged connecting means therefor, of resetting means comprising sleeves engaging with one another by a ratchet-tooth connection and with the respective numeral-wheels by a pin-and-slot connection permitting relative longitudinal movement but transmitting rotative movement.

ISAAC S. DEMENT.

Witnesses:

A. P. KNIGHT,
J. GREEN.