No. 684,310. Patented Oct. 8, 1901.

C. J. ROOT.

COUNTER.

(Application filed Nov. 12, 1900.)

(No Model.)

Fig. 1.

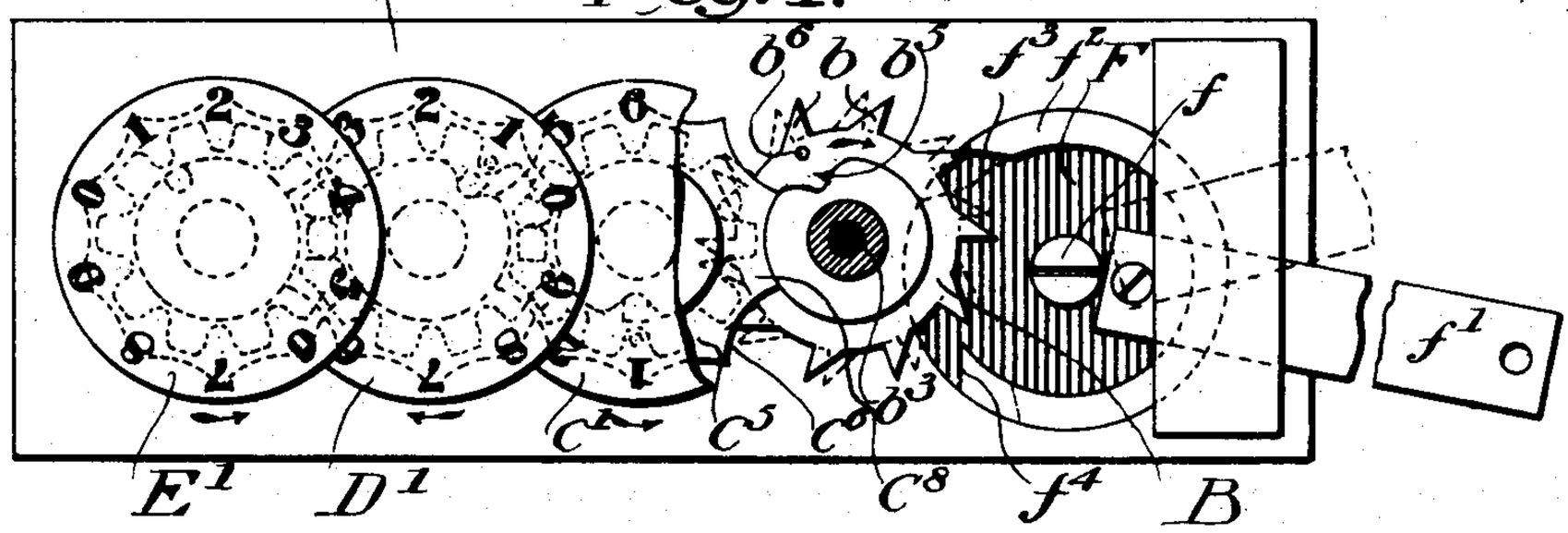


Fig. 2.

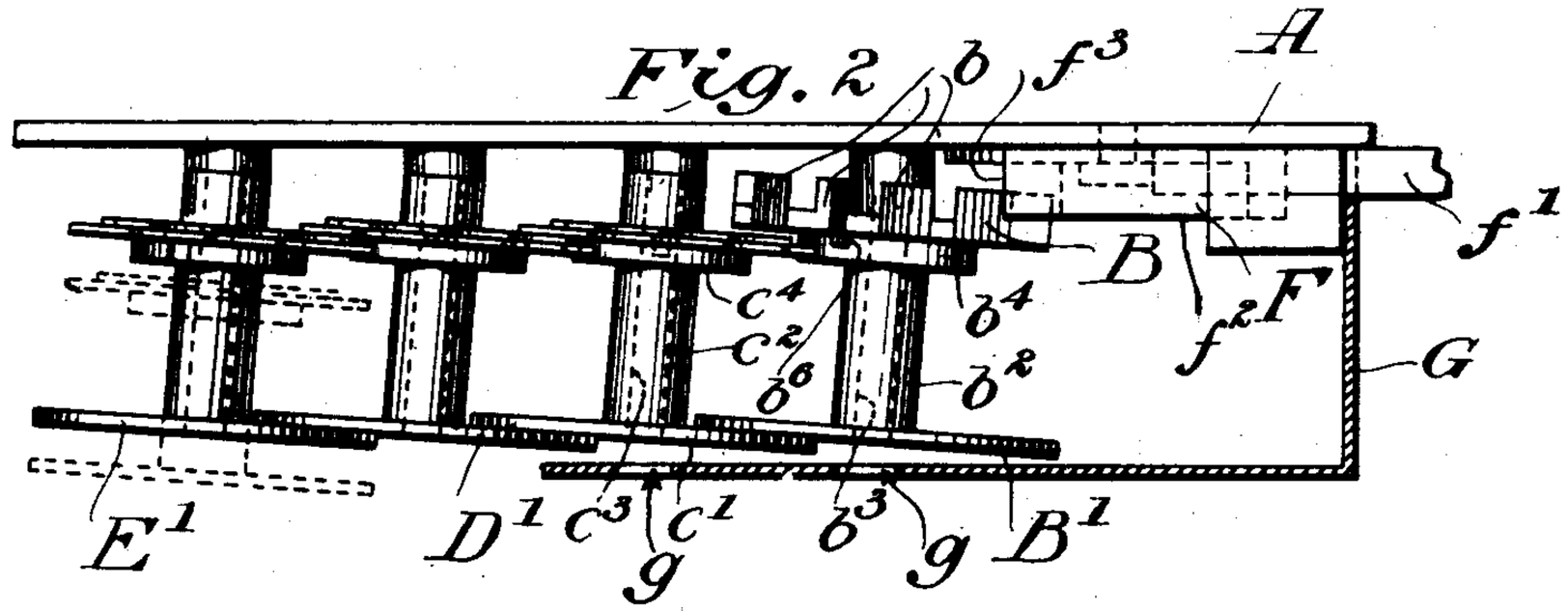


Fig. 3.

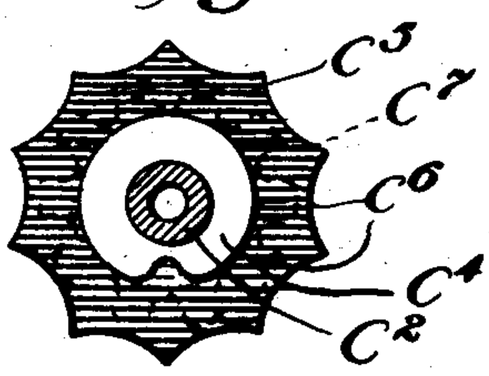


Fig. 4.

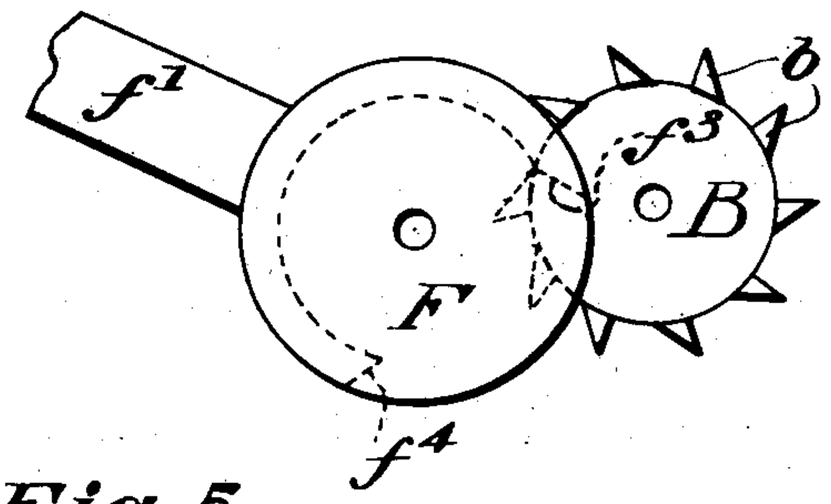
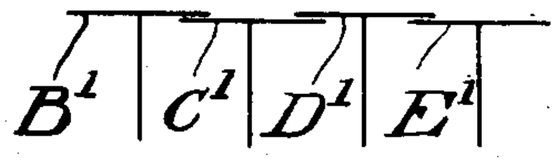


Fig. 5.



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CHARLES J. ROOT, OF BRISTOL, CONNECTICUT.

COUNTER.

SPECIFICATION forming part of Letters Patent No. 684,310, dated October 8, 1901.

Application filed November 12, 1900. Serial No. 36,216. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. ROOT, a citizen of the United States, residing at Bristol, Connecticut, have invented certain new and useful Improvements in Counter Mechanisms, of which the following is a clear, full, and exact description.

My invention relates to constructions suitable for use in counting mechanisms and the like; and my object is to provide a device which is strong and simple and which will not be liable to get out of order. Other advantages of my construction will be apparent from the following description.

In the drawings showing the preferred embodiment of my invention, Figure 1 is a side elevation of my device applied to a counting mechanism, parts being broken away to show the actuating mechanism. Fig. 2 is a top plan view, the case being partially broken away and showing in dotted lines one indicating-dial in a position so that it can be freely rotated. Fig. 3 is a detached view of the actuating-wheels controlling the movement of one of the indicating-dials. Fig. 4 is a rear view of the ratchet-wheel and reciprocating pawl, showing the pawl in the position in which the ratchet-wheel is locked. Fig. 5 is a diagram of a modification.

In the above-illustrated preferred embodiment of my invention, A represents the base or supporting plate, upon which the mechanism is mounted.

B is the ratchet-wheel, in this case having pointed teeth *b b*. In order to leave a space behind these teeth, so that the pawl may pass between two of the teeth and behind one of the same, as shown in Fig. 4, I have in this embodiment formed the teeth so that they project laterally from the wheel B, as illustrated in Figs. 2 and 4.

B′ is an indicating-dial rotated by the ratchet-wheel. In this embodiment I have connected the indicating-dial B′ and ratchet-wheel B by means of the sleeve b^2, on which the ratchet-wheel and dial are fixed. The sleeve is mounted on the spindle b^3, which is, as shown in dotted lines in Fig. 2, attached to the base A, and said sleeve is preferably freely rotatable thereon.

b^4 is a wheel also connected with the dial B′, in this embodiment by being fixed to the sleeve b^2. This wheel b^4 has a substantially smooth periphery, with the exception of the notch b^5. The ratchet-wheel carries a pin b^6.

C′ is a second indicating-dial, preferably similarly mounted on a sleeve c^2, which carries a similar smooth wheel c^4 and freely rotates on the spindle c^3. On the sleeve c^2 is mounted a wheel c^5, having reëntrant curves c^6 c^6 cut in its periphery. These curves are equal in number to the numbers "1," "2," "3," &c., carried on the dial, and each curve is preferably adapted to fit the surface of the smooth wheel b^4, as shown in Fig. 1. Connected with the dial C′, in this embodiment by being also mounted on the sleeve c^2, is a toothed wheel c^7, (shown in dotted lines in Fig. 3,) having teeth equal in number to the numbers "1," "2," "3," &c., carried by its dial. It will be obvious that when the wheel c^5 is in engagement with the smooth wheel b^4, as illustrated in Fig. 1, the ratchet-wheel may be rotated, but the dial C′ will be locked in position. When, however, the pin b^6 comes in contact with one of the teeth on the wheel c^7, the point c^8 of the wheel c^7 (see Fig. 1) will be over the notch b^5, and when the wheel c^7 is rotated said point c^8 will enter the notch b^5, thus unlocking curved wheel c^5 and allowing it to rotate one notch. The dial C′ will therefore be rotated in this case one-tenth of a revolution, bringing the next curved face c^6 against the smooth face of the wheel b^4 and again locking the dial C′ from rotation.

D′ E′ are other indicating-dials also carrying numbers on their faces and are preferably constructed and rotated similarly to dial C′. It will be obvious with this construction that with each rotation of the ratchet-wheel the dial C′ will be rotated one notch in an opposite direction, and with each rotation of C′ the dial D′ will be rotated one notch in a direction opposite to that of the dial C′, and the dial E′ will be rotated one notch for each revolution of the dial D′, but in a direction opposite thereto.

F is an actuating-pawl adapted to strike one of the teeth on the ratchet-wheel and rotate said wheel. This pawl is preferably a reciprocating pawl pivoted at *f* and may be reciprocated by the projecting arm *f′*. In devices of this kind it is very desirable that there shall be no possibility of the pawl coming in con-

tact with any of the teeth on the ratchet-wheel without easily moving the said wheel, because if the parts do not freely move in whatever position they may engage each other they are liable to come into violent engagement and be broken or otherwise damaged. In order to prevent such an occurrence, I have in the embodiment shown in the drawings formed the teeth of the ratchet-wheel with sharp points or edges, as shown, and I have made the portion of the pawl which first comes in contact with the teeth also sharp-pointed. With such a construction there is practically no danger of a violent engagement between the pawl and any of the teeth. In order to keep these points of the pawl and teeth sharp and prevent their becoming rounded off, I have formed the parts so that they will tend to be continually sharpened by the friction between the same. As shown in Fig. 1, I have formed a portion of the pawl f^2 as an arc of a circle having the pivot f as a center, and this portion is cut away to form an engaging face f^3. I have preferably inclined this face so that it will strike the edge of the teeth of the ratchet-wheel at a slight angle, as shown in said Fig. 1. As the pawl is advanced from the position shown this face will slide over the pointed end of the tooth and also press down upon the same, and this friction will tend to sharpen the point of the tooth and when the two points meet the point of the pawl also. As the pawl is further advanced it will slide along the said tooth, and the point of the pawl when it approaches the base of the tooth will slide over it and into the position shown in Fig. 4 and will tend to be sharpened by the resulting friction. In this way the point of the pawl and the points or edges of the teeth will tend to automatically sharpen themselves. I do not, however, desire to be limited to such construction.

In order to lock the ratchet-wheel from rotation, I allow the end of the pawl to pass between the teeth and beneath one of the same, as shown in Fig. 4. When the pawl has reached this position beneath the tooth, the ratchet-wheel, and therefore all the indicating-dials, is locked in position, because the tooth on the ratchet-wheel when the wheel is rotated backward does not act as a cam to throw back the pawl, but the tooth and pawl coöperate to form a lock, which prevents backward rotation of the wheel. The wheel, and therefore the dials, cannot be rotated until the pawl is withdrawn. I preferably form a similar point and face at f^4 on the pawl, so that it will contact in substantially a similar manner with a (preferably the next succeeding) tooth of the ratchet-wheel. By the construction above described the ratchet-wheel and dial B′ are rotated one figure at each movement of the pawl. There is no danger of a violent engagement between the teeth of the ratchet-wheel and the pawl, as both are pointed, and with the construction above illustrated these points tend to remain sharpened. The sliding action of the pawl over the teeth makes the action very simple and renders the device easy of operation, and when the point of the pawl is behind one of the teeth, as shown in Fig. 4, the dials are locked in position.

In order to set the indicating-dials in any position desired, I have arranged the wheels c^5 and b^4 so that one may be moved away from engagement with the other. In the present embodiment wheel c^5 is movable away from wheel c^4 preferably by sliding the sleeve on which it is mounted forward on the spindle, as shown in dotted lines in Fig. 2. The dial may then be freely rotated and set in any position desired and slipped back to the locked position shown in said figure. All the above-described mechanism except the lever f' is intended to be inclosed in a case, (partially shown by dotted lines in Fig. 2,) which may be pivoted to the base A.

In order to bring the numbers on the overlapping dials as near as possible to the observation-holes $g\,g$ in the case, I have brought the corresponding parts—for example, the upper parts of each dial—into a line substantially parallel to the base A. This I have accomplished by inclining the spindles, as shown, which brings the corresponding parts of the dials to an equal distance from the case, and consequently one dial may be seen as plainly as any other. In Fig. 5 I have shown in diagram an alternative arrangement of the dials.

It will be obvious and I am aware that many changes may be made in the construction illustrated and described without departing from the spirit of my invention, and I therefore do not desire to be limited to the particular embodiment herein disclosed.

What I claim is—

1. In an indicator mechanism in combination, a base, a plurality of sloping and substantially parallel spindles thereon, an indicator-dial carrying figures on its face and rotatably mounted on one of said spindles and provided with a wheel having a substantially smooth periphery and a depression therein fixed thereto so as to be rotatable therewith, said smooth wheel being separated a distance from said indicator-dial, a second indicator-dial rotatable on the other spindle and overlapping said first dial in front of the same, a wheel fixed to said second indicator-dial so as to be rotatable therewith and having reëntrantly-curved portions on its periphery adapted to engage the periphery of said smooth wheel whereby said second dial is normally locked in position, and means rotatable with said first indicator-dial adapted to rotate said reëntrantly-curved wheel and its dial as said depression in said smooth wheel reaches said reëntrantly-curved wheel, said second dial and reëntrantly-curved wheel being movable longitudinally on their spindle to slip said reëntrantly-curved wheel off from said smooth-faced wheel into said space be-

tween said smooth-faced wheel and first dial, whereby said second indicator may be freely rotated and reset, a pallet-wheel having laterally-extending pointed teeth and connected with said first dial to rotate the same, a reciprocating pointed pawl adapted to engage the pointed teeth on said pallet-wheel and rotate the same and move beneath said teeth to lock said wheel from rotation.

2. In an indicator mechanism in combination, a base, a plurality of spindles thereon, an indicator-wheel having numbers on its face rotatably mounted on one of said spindles and provided with a wheel which is fixed thereto so as to be rotatable therewith and has a substantially smooth periphery and a depression therein, a second indicator-wheel having numerals on its face and rotatable on the other spindle, a wheel fixed to said second indicator-wheel so as to be rotatable therewith and having reëntrant portions adapted to engage the periphery of said smooth wheel whereby said second indicator-wheel is normally locked in position, means rotatable with said first indicator-wheel and adapted to rotate said reëntrant wheel as said depression in said smooth wheel approaches it, one of said indicator-wheels being movable longitudinally on its spindle to separate said reëntrant wheel and said smooth-faced wheel and allow one of said indicators to be rotated, a pallet-wheel having laterally-extending pointed teeth and connected with said first indicator-wheel to rotate the same, a reciprocating pawl having a pair of points adapted to engage said pointed teeth on said pallet-wheel to rotate said wheel and move between said teeth and beneath one of the same to lock said wheel from rotation.

Signed at Bristol, Connecticut, this 8th day of November, 1900.

CHARLES J. ROOT.

Witnesses:
F. E. NORTHROP,
CARLOS V. MASON.