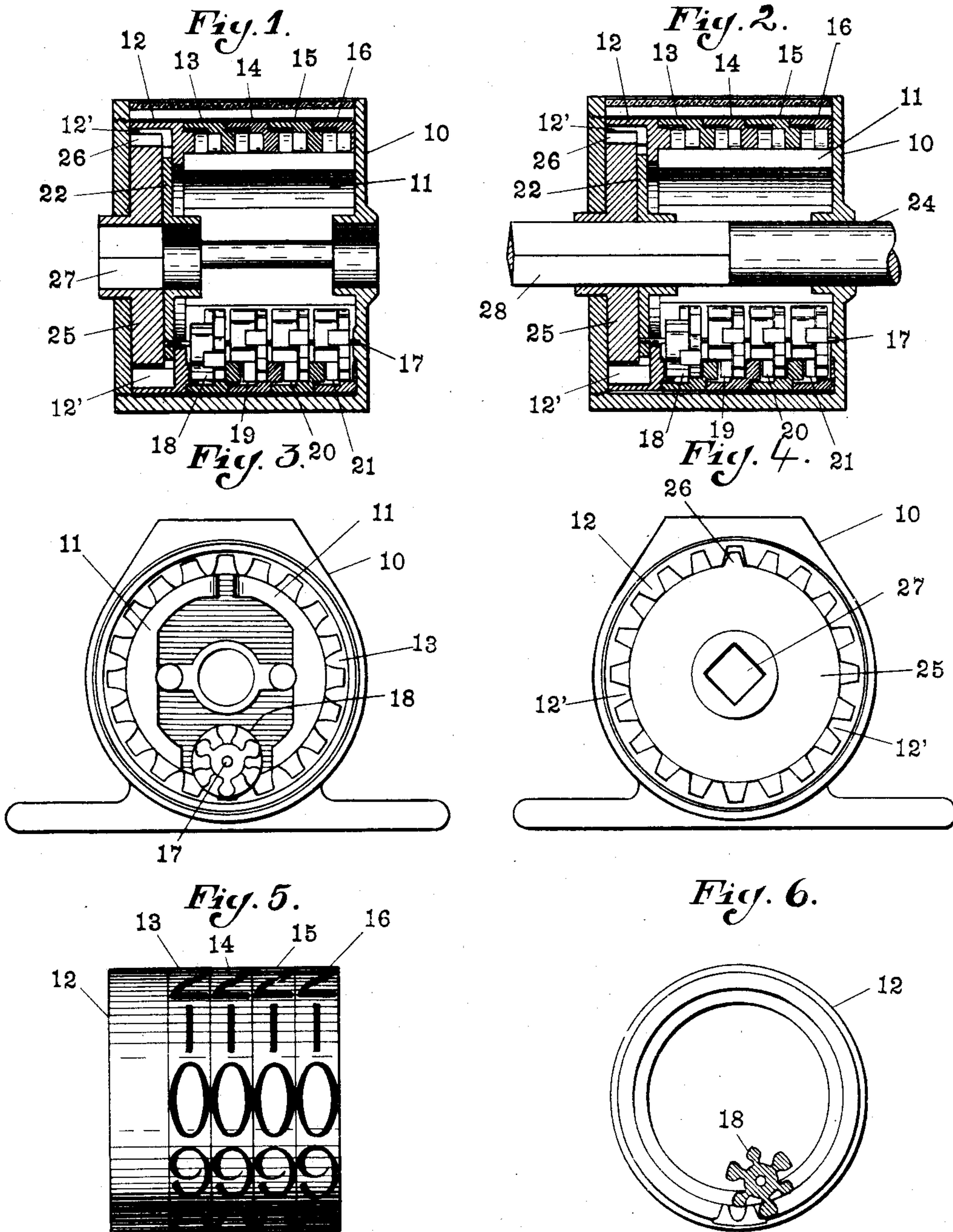


C. CHRISTENSEN.  
COUNTER FOR VOTING MACHINES.

APPLICATION FILED JULY 18, 1903.



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# UNITED STATES PATENT OFFICE.

CHRIST CHRISTENSEN, OF INDIANAPOLIS, INDIANA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO COLUMBIA VOTING MACHINE COMPANY, OF INDIANAPOLIS, INDIANA, A CORPORATION OF INDIANA.

## COUNTER FOR VOTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 793,178, dated June 27, 1905.

Application filed July 18, 1903. Serial No. 166,157.

*To all whom it may concern:*

Be it known that I, CHRIST CHRISTENSEN, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Counters for Voting-Machines, of which the following is a specification.

The object of my invention is to produce an inclosed counter which may be operated in either direction by continuous or complete rotation of an operating-shaft, the arrangement being such that the step-by-step movement of the counting elements will take place during a comparatively short period of movement of the rotated operating element, and the arrangement also being such that the operating-shaft may pass completely through the counter without becoming disconnected from operative engagement with the shaft. To this end I have slightly modified the construction of the common and well-known inclosed counter known in the market as the "Veeder" counter, the rearrangement having especially in view the production of a counter especially adapted for use in connection with voting-machines of the type shown in my Patent No. 658,204.

The accompanying drawings illustrate my invention.

Figure 1 is a longitudinal section of a Veeder counter embodying my invention. Fig. 2 is a similar view with a portion of an operating key or shaft in position. Fig. 3 is an end elevation with the inclosing cap and my attachment removed. Fig. 4 is an end elevation with my attachment in position; Fig. 5, a side elevation of the nested counter-wheels, and Fig. 6 a sectional detail of one of the counting-wheels and its operating-pinion.

In the drawings, 10 indicates an inclosing casing, within which is arranged a pair of nearly semi-annular bearing-lugs 11 11, which are usually formed integral with the casing 10. Journaled upon lugs 11 within casing 10 are rings 12, 13, 14, 15, and 16, which are nested together in the usual manner, as shown. Mounted upon a suitable shaft 17 is a series of pinions 18, 19, 20, and 21, which form a

driving connection between the elements 12 and 13, 13 and 14, 14 and 15, 15 and 16, respectively, in the usual well-known manner. The several elements are held in position by a cap 22 in the usual manner.

It has heretofore been customary in counters of this class for the element 12 to be the units-counting element, element 13 the tens, element 14 the hundreds, &c., and the element 12 has been provided with a plurality of teeth 12', either ratchet or gear teeth, by which the element 12 can be advanced step by step ten steps for a complete revolution. One means of producing a step-by-step movement of the element 12 consisted of a completely-rotatable shaft, which had upon its inner end an eccentric upon which was mounted a non-rotatable gear having fewer teeth than the number of teeth 12' and meshing therewith, the arrangement being such that as the operating-shaft was rotated through a complete revolution in either direction the element 12 would be advanced or retracted one-tenth of a revolution. This construction I find to be unavailable for voting-machines, for the reason that the element 12 was in movement during slightly more than one-half of the time of revolution of the operating-shaft, and as a consequence slight variations in the position of the operating-shaft might lead to uncertainty as to the proper position of the counting element 12. In another form a continuously-rotating shaft is connected to the element 12 by means of intermediate friction-wheels which cause the element 12 to rotate in a direction opposite to that of the direction of rotation of the operating-shaft, so that the element 12 would be moved in one direction or another by any movement of the operating-shaft. Such a construction besides being expensive is also objectionable in a voting-machine of the type shown in my patent mentioned, for the reasons already stated. In order to overcome these difficulties, my invention consists in the removal of the numbers from the periphery of element 12, thus making the element 13 the units element, the element 14 the tens, &c., and providing means by which the element 12 may be directly connected to the operat-



ing-shaft 24 for continuous rotation therewith. This means consists of a disk 25, provided on its periphery with one or more teeth 26 to take between any two of the teeth 12' and  
 5 provided with a central polygonal opening 27, adapted to receive the polygonal end 28 of the shaft 24. This results in the interposition of a completely-rotatable element between the  
 10 units element and the operating-shaft and a connection between the completely-rotatable element 12 and the units element by pinion 18, whereby the element 12 will only operate upon the units element 13 during a tenth of its period of rotation. There is therefore a  
 15 wide range in variation of position of the operating-shaft 24, which will not in any manner affect the units element 13, so that the shaft 24 may be out of its normal angular position to a considerable extent without en-  
 20 dangering the proper position of the counting elements. It will be noticed also that the central perforation of the operating-disk 25 permits the extension of the operating-shaft completely through the counter, and thus ren-  
 25 ders possible the sliding of the counter as a whole upon the operating-shaft, yet without disconnecting the counter from the shaft. As a consequence the movement of the counter along the shaft does not permit the displace-  
 30 ment of any of the counter elements by any movement other than a proper and permissible movement of the operating-shaft, and for this reason the counter is especially valuable for voting-machines, where it is essential  
 35 that every safeguard be provided to prevent an improper manipulation of the counter.

I claim as my invention—

1. In a counter, the combination, with a plurality of coaxial counting elements and in-  
 40 termediate step-by-step operating-gearing, of an operating element coaxial with the counting elements and completely rotatable at each counting action, a step-by-step gearing be-  
 45 tween said completely-rotatable operating element and the units element operating upon the units element at each rotation through a very limited portion of the angular movement of the operating element, and an inclosing casing entirely inclosing said mechanism.

50 2. A counter consisting of, a plurality of coaxial rotatable counting-wheels, an intermediate step-by-step gearing therebetween, an operating element completely rotatable at  
 55 each counting action, an intermediate gear between said element and the first counting element whereby the operating element will act upon the first counting element at each rotation through only a very limited portion of its angular movement, an inclosing casing en-  
 60 tirely inclosing said mechanism, and a completely-rotatable operating-shaft extending through said casing and engaging the completely-rotatable operating element.

3. In a counter, the combination, with a plurality of coaxial completely-rotatable an- 65  
 nular counting elements and intermediate step-by-step operating-gearing, of a completely-rotatable operating element, intermediate  
 step-by-step operating-gearing between said operating element and the first counting ele- 70  
 ment, a centrally-perforated disk 25 adapted to engage the operating element and coaxial therewith, an inclosing casing entirely inclos-  
 ing said mechanism, and a shaft extending 75  
 through said casing and through said disk 25 and engaging said disk 25 to rotate the same in either direction, substantially as and for the purpose set forth.

4. In a counter, the combination, with a plurality of coaxial counting elements and in- 80  
 termediate step-by-step operating-gearing, of a completely-rotatable operating element co-axial with the counting elements and com-  
 pletely rotatable at each counting action, and a step-by-step gearing between said com- 85  
 pletely-rotatable operating element and the units element operating upon the units element at each rotation through a very limited  
 portion of the angular movement of the op- 90  
 erating element.

5. A counter consisting of, a plurality of rotatable coaxial annular counter-wheels and intermediate step-by-step gearing therebe-  
 tween, an operating element coaxial with the counter-wheels and completely rotatable at 95  
 each counting action, an intermediate gear between said element and the first counting ele-  
 ment operating upon the units element at each rotation through only a very limited portion 100  
 of its angular movement, and a completely-rotatable operating-shaft extending through and engaging the completely-rotatable oper-  
 ating element.

6. In a counter, the combination, with a plurality of coaxial completely-rotatable an- 105  
 nular counting elements and intermediate step-by-step operating-gearing, of a completely-rotatable annular operating element coaxial  
 with the counting elements, intermediate 110  
 step-by-step operating-gearing between said operating element and the first counting ele-  
 ment, a centrally-perforated disk 25 adapted to engage the operating element and coaxial  
 therewith, an inclosing casing for the afore- 115  
 said parts, and a shaft extending through said disk 25, counting elements and casing and en-  
 gaging said disk 25 to rotate the same in either direction, substantially as and for the purpose set forth.

In witness whereof I have hereunto set my 120  
 hand and seal, at Indianapolis, Indiana, this 2d day of June, A. D. 1903.

CHRIST CHRISTENSEN. [L. s.]

Witnesses:

ARTHUR M. HOOD,  
 JAMES A. WALSH.