Sept. 9, 1924. 1,508,121

J. K. OLSEN

REVOLUTION COUNTER

Filed June 2, 1922

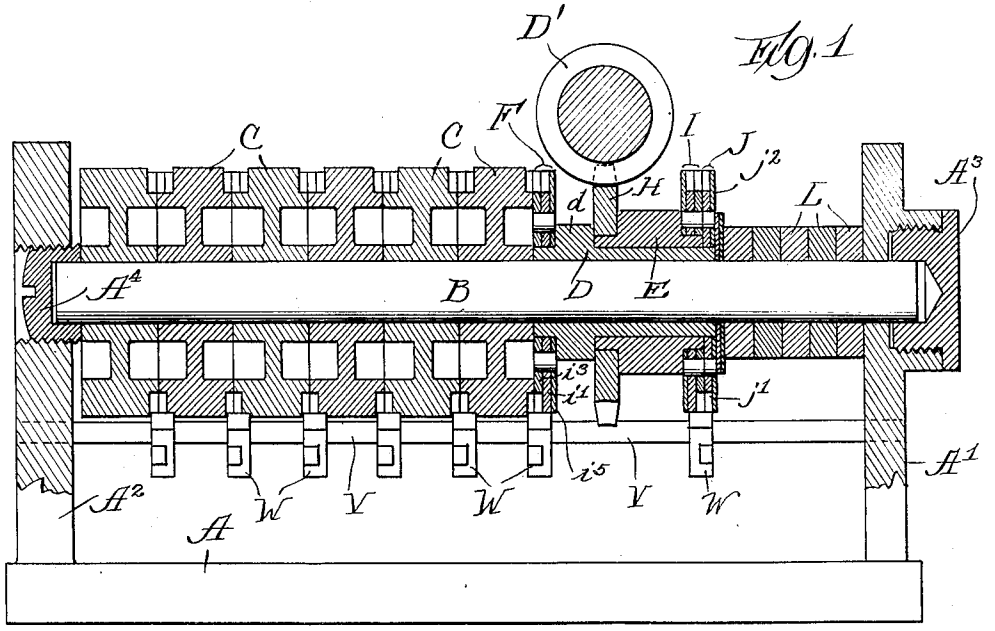


Fig. 1

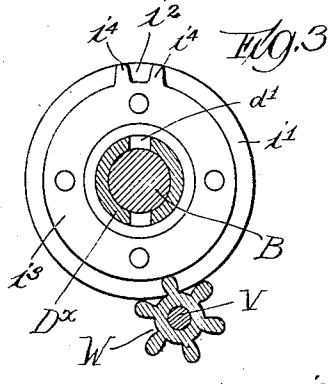


Fig. 3

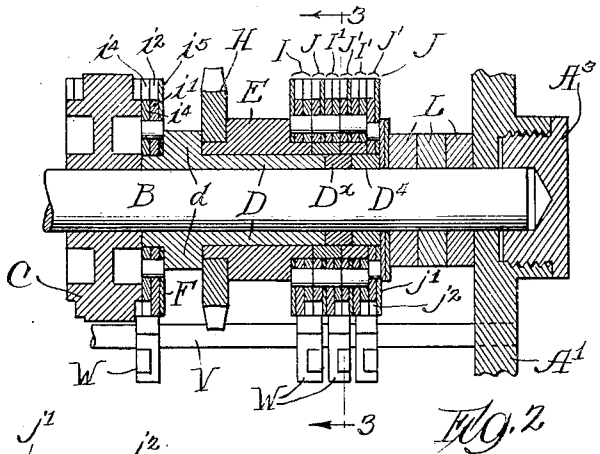


Fig. 2

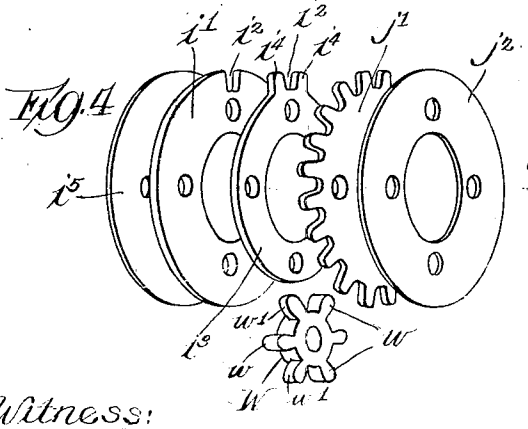


Fig. 4

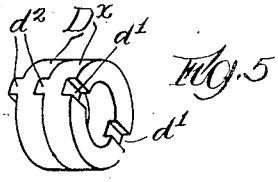


Fig. 5

Witness:
Conrad M. Olsen

Inventor
John K. Olsen
by Burton & Burton Atty's.

Patented Sept. 9, 1924. 1,508,121

UNITED STATES PATENT OFFICE.

JOHN K. OLSEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO STEWART-WARNER SPEEDOMETER CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF VIRGINIA.

REVOLUTION COUNTER.

Application filed June 2, 1922. Serial No. 565,501.

To all whom it may concern:

Be it known that I, JOHN K. OLSEN, a citizen of the United States, having residence in the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Revolution Counters, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved construction in a revolution counter, the improvement consisting in simplifying and reducing the cost of the device and adapting it for range of variability as to speed reduction from the initial driven wheel to the initial counter wheel. It consists in the elements and features of construction shown and described as indicated in the claims.

In the drawings:—

Figure 1 is an axial section of a device embodying this invention.

Figure 2 is a partial axial section similar to Figure 1, showing the modification of which the device is susceptible for varying the speed reduction from the initial driven gear of the mechanism to the initial counter wheel.

Figure 3 is a section at the line, 3—3, on Figure 2.

Figure 4 is a dissected perspective view of the mutilated gear couples and co-operating pinion employed in speed reduction.

Figure 5 is a perspective view of interlocking extension rings for extending the inner sleeve of the speed reducing train.

The device comprises a frame structure, A, having brackets, A^1 and A^2, affording bearings for the main shaft, B. As shown, this main shaft is supported in screwed-in bushings, A^3 and A^4, at the opposite ends, of which the bushing, A^4, at the left hand end extends entirely through the standard or bracket, A^2, for reaching and bearing upon the left hand counter wheel, so that by the adjustment of this bushing the entire assemblage of said counter wheels may be set snugly together, taking up all slack or redundant spacing which may happen to exist by reason of unavoidable variations in dimensions of the parts. Rotatably mounted on the shaft, B, are the counter wheels, C,—six in number, as shown,—in train with customary carrying wheels, W, on the shaft, V, parallel to the shaft, B, in all respects of familiar construction requiring no description at this point. At the right hand of the counter wheel, C, on the shaft, B, there is a sleeve, D, having fast upon its left-hand end a speed reducing gear, F, of the same construction as the driving gear portion of each of the counter wheels, C, (except the last which is driven only and does not drive), and which has fast on its right hand end a gear, J, identical in construction with the driven gear portion of each of the counter wheels, C. The sleeve, D, has an annular spacing boss, *d*, which forms a stop shoulder for positioning the gear member, F; and on said sleeve, D, at the right hand of said spacing boss there is mounted a second sleeve, E, having fast upon it at its left hand end the prime driven gear, H, and having fast upon it at the opposite end a gear, I, which is a duplicate of the gear, F, on the sleeve, D. Referring to Figure 1, this gear, I, co-operates directly,—that is, through a single transfer or carrying pinion as hereinafter described,—with the gear, J, for rotating the sleeve, D, and the gear, F, thereon, for driving the first counter wheel, C; but in Figure 4 there are shown interposed between the gear, I, and the gear, J, additional gear couples, comprising each a driving gear, I^1, and driven gear, J^1, identical in construction, respectively, with the gears, I and J, co-operating through transfer or carrying pinions, for additional steps of speed reduction between the prime driven gear, H, and the counter wheel train. To afford mounting for these interposed gear couples, the inner sleeve, D, is extended by rings, D^x, interlocked successively with said sleeve, D, and with each other by a notch, d^1, on one of the interlocked parts engaged by a projection, d^2, on the other. It will be understood that the driven gear or reduced-speed gear, J, above described as secured fast to the right hand end of the sleeve, D, will be fast on the last extension ring, D^x, at the right, when the additional gear couples are interposed as described. At the right of the last driven or reduced speed gear, J, the unoccupied length of the shaft, B, above said gear, J, to the right hand standard or bracket, A^1, is taken up with spacer rings, L, whose thickness or axial length, each is that of one of the gear couples, I^1, J^1, so that to ac-

commodate any desired number of interposed gear couples for changing the speed reduction, it is only necessary to omit a like number of the spacers.

The prime driven gear, H, is shown as a worm gear driven by a worm, D^1, on a shaft journaled in the frame, A; and it may be understood that this shaft, B, is adapted in any suitable manner for engagement with the shaft whose revolutions are to be counted, the particular form or terminal of the shaft for this purpose not being shown.

As indicated, the gear connection for speed reduction between the sleeves, D and E, and from the sleeve, E, to the first counter wheel, is substantially identical with the familiar and customary carrying-gear connection from counter wheel to counter wheel of the counter train. And although this is a familiar construction, it is illustrated and will be described for the purpose of indicating definitely what are the parts referred to in the above description and in the claims by the terms, "speed reducing gear," "reduced speed gear," and "speed reducing couple." Referring to Figures 2 and 3, the speed reducing gear, I, is a multilated gear having three zones, conveniently made in three pieces riveted or soldered together, one of which comprises the delay segment, i^1, and the gear interspace or notch therein, i^2. The next zone comprises the clearance segment, i^3, and the two gear teeth, i^4, i^4, with the interspace, i^2, continued between them. The third zone, i^5, is the uninterrupted periphery of a mere mounting plate, corresponding to the body of the counter wheel, C, which has situated laterally thereof, parts corresponding to the first two zones described. The driven gear or reduced speed gear, J, comprises two zones, j^1, constituting a continuously toothed or uninterrupted gear, and j^2, constituting a mere mounting disk corresponding to the body of the counter wheel which has at its right hand side a continuous gear rim corresponding to j^1. The carrying pinion, W, which transmits reduced speed from the speed reducing gear, I, to the reduced-speed gear, J, is the familiar pinion of the Geneva stop movement, having alternate full width and half width teeth, w and w^1, respectively, cooperating in the well understood manner requiring no description, with the mutilated gear, I, and the continuously toothed gear, J.

I claim:—

1. A revolution counter comprising a standard and a main shaft or axle supported thereon for carrying the counter wheels rotatably side by side on said shaft; a sleeve on said shaft; an initial mutilated speed-reducing gear rigid as to rotation with said sleeve at the end thereof adjacent to the initial counter wheel; a reduced-speed gear fast on the other end of said sleeve; a second sleeve rotatively mounted on the first mentioned sleeve and longitudinally stopped thereon; a prime driven gear rigid as to rotation with said second sleeve proximate to the first mentioned mutilated or speed-reducing gear of the first sleeve, and a speed-reducing or mutilated gear fast on the other end of said second sleeve.

2. In the structure defined in claim 1, foregoing, speed-reducing intermediate gear couples rotatably carried on said two sleeves between said last mentioned gear and said reduced speed gear on the first mentioned sleeve.

3. In the structure defined in claim 1, foregoing, speed reducing intermediate gear couples rotatably carried on said two sleeves between said last mentioned gear and said reduced speed gear on the first mentioned sleeve, said first mentioned sleeve comprising a main member and one or more extension rings coupled successively for rotation as rigid with the main member, said extension rings being axially dimensioned to correspond with the intermediate gear couples, respectively.

4. In the construction defined in claim 1, foregoing, speed reducing intermediate gear couples, rotatably carried on said two sleeves between said last mentioned gear and the reduced speed gear on the first mentioned sleeve, said first mentioned sleeve comprising an initial or main member and extension rings successively coupled thereto for rotation as rigid therewith and spacing rings or washers on the first mentioned sleeve, said extension rings and spacing washers being axially dimensioned correspondingly with the gear couples.

5. In the construction defined in claim 3, foregoing, the inner and longer sleeve comprising interlocking sections extending the sleeve, the axial length of each of said sections being that of a speed-reducing couple, and spacing sleeves or washers of the same axial dimension each as said sections, for spacing the reduced speed gear on the end of the longer sleeve from the adjacent frame bearing of the main shaft.

In testimony whereof, I have hereunto set my hand at Chicago, Illinois, this 29 day of May, 1922.

JOHN K. OLSEN.