

F. W. BUCKINGHAM.
REGULATOR FOR WATCHES.
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898,962.

Patented Sept. 15, 1908.

Fig. 1.

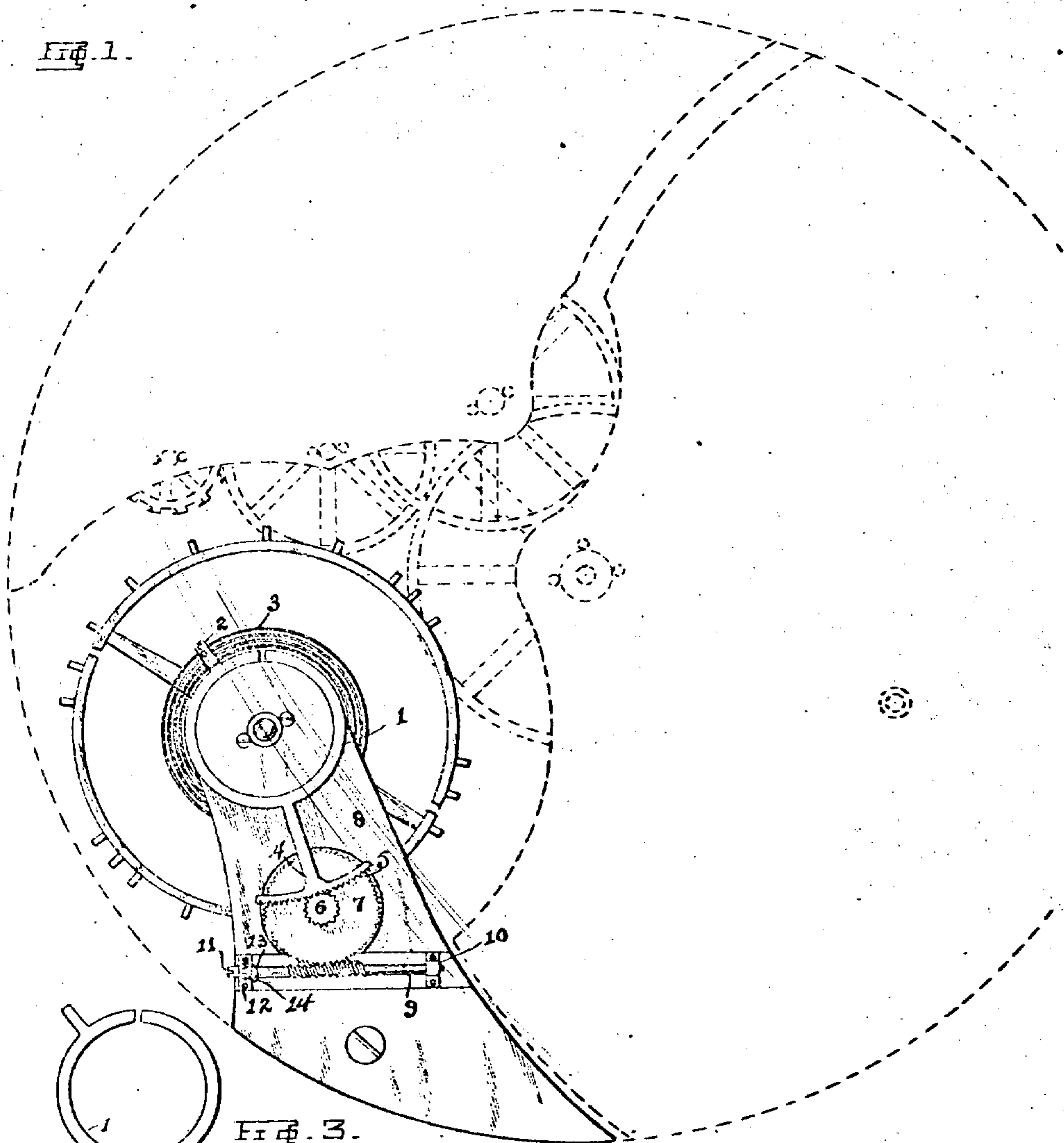


Fig. 3.

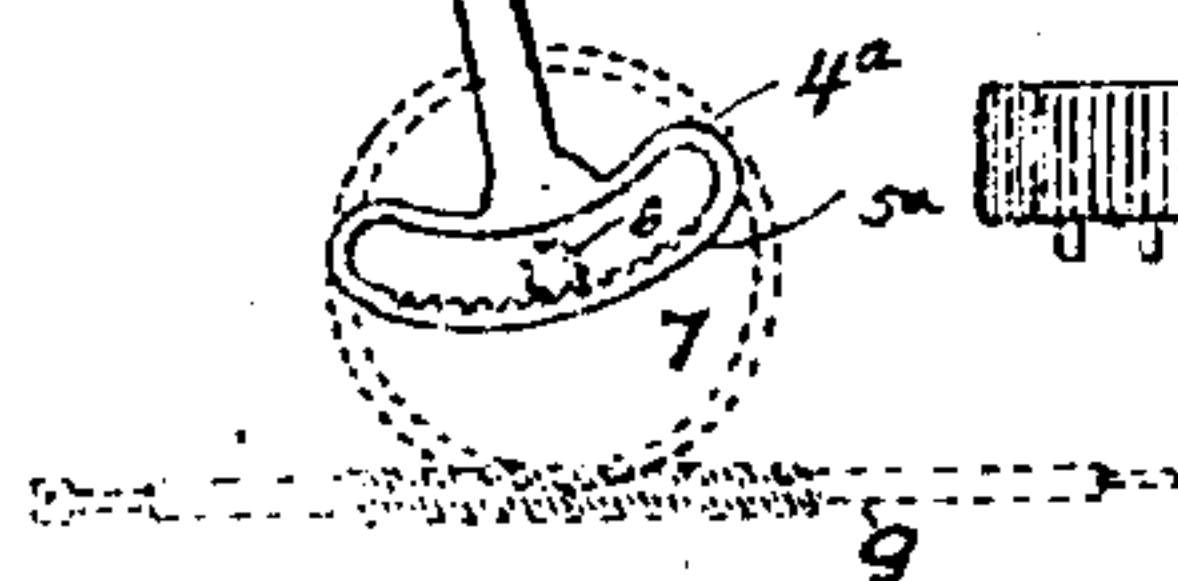
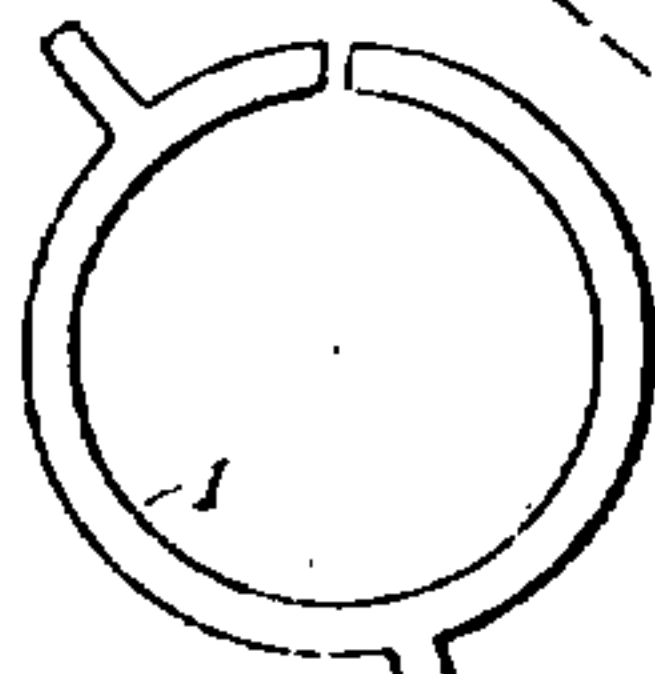
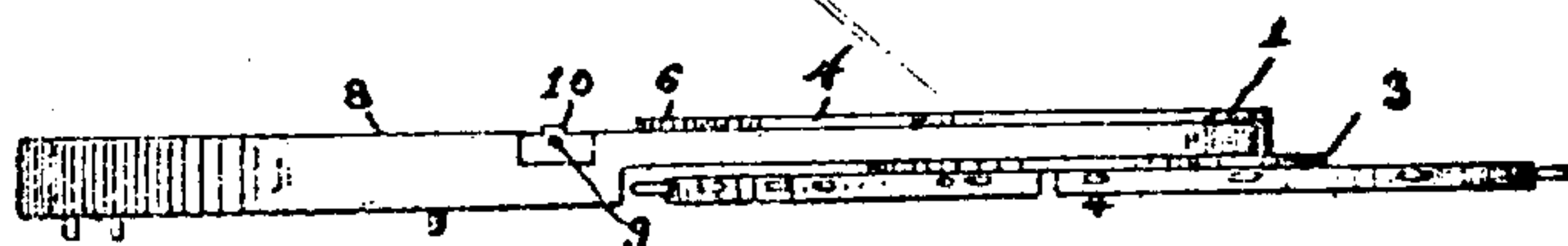


Fig. 2.



WITNESSES:

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FRANK W. BUCKINGHAM, OF GREENSBURG, PENNSYLVANIA, ASSIGNOR OF TWO-FIFTHS TO
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REGULATOR FOR WATCHES.

No. 898,962.

Specification of Letters Patent.

Patented Sept. 15, 1908.

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To all whom it may concern:

Be it known that I, FRANK W. BUCKINGHAM, a citizen of the United States, and residing in the borough of Greensburg, in the county of Westmoreland and State of Pennsylvania, have invented or discovered new and useful Improvements in Regulators for Watches, of which the following is a specification.

My invention consists in certain new and useful Improvements in regulators for watches. Many mechanisms have been devised and adopted for that purpose but the closest adjustment now possible is within about six seconds per week. Such a variation, while seemingly negligible, mounts up rapidly and the watch must at frequent intervals be returned to the shop for readjustment and setting. Owing to the imperfection of the mechanisms now in use, a nice adjustment by the watchmaker is practically out of the question so that a greater variation is likely to result instead of the desired correction. To overcome this irregularity, I have provided means for controlling the movement of the regulator so that the motion of the member which is engaged by the watch maker's tool is reduced when applied to the regulator proper to a very small fraction of the original motion. The result is that a substantial movement of said member results in an infinitesimal adjustment of the regulator thus allowing very nice regulation. I effect this by providing the regulator proper with a toothed segment or bar which meshes with a gear wheel or pinion which in turn is controlled by a worm shaft or screw. I prefer to mesh the segment with a small pinion concentric and rigid with a larger wheel which meshes with said worm shaft, which shaft may be engaged directly by the watchmaker's tool.

In the accompanying drawings, Figure 1 is a plan view of the works of a watch, the regulator being shown in full lines and certain other parts of the works being dotted in for the sake of clearness: Fig. 2 is a side elevation of the regulator, and Fig. 3 is a partial plan view showing a modification.

In the drawings, 1 is the regulator proper which is attached at 2 to the hair spring 3 in the usual manner.

4 is a segment or bar which is integral with or attached to the regulator and provided

with V shaped teeth 5. Said toothed segment 4 meshes with the teeth of the small pinion 6 which is mounted concentrically with and rigidly attached to the larger gear wheel 7, both of said gears being pivoted friction tight to the cock 8. The cock 8 is preferably recessed, as shown, to accommodate the wheel 7 so that the top of said wheel is flush with the top of the cock thus permitting the regulator 1 to rest flat on said cock. Meshing with the V shaped teeth of said wheel 7 is the worm shaft or screw 9 which is journaled in the cock in the following manner. The cock is recessed to permit the said screw to assume the proper position to mesh properly with the wheel 7. One end of said shaft is reduced in diameter to engage the hole in the pierced lug 10 which is attached to the cock in any convenient manner. The other end of said shaft is slotted, as at 11, or otherwise fitted, to be engaged by the watchmaker's screwdriver or other tool. Adjacent to the slotted end said shaft 9 is provided with a section of reduced diameter which is engaged by a strap 12 which is attached to the cock 8 by any convenient manner. Between the shoulder 13 on said shaft and the face of the strap 12 I mount on said shaft a dish shaped metal washer 14 of spring material which presses peripherally against said strap and maintains said shaft tension tight in its journals.

It is evident from the above that if shaft 9 is rotated a fraction of a turn by the watchmaker's tool, the wheel 7 will also be partially rotated, carrying with it pinion 6 which in turn adjusts the regulator 1 by means of segment 4. It is also evident that the movement which the regulator receives has been greatly reduced from the original movement of the shaft 9. This reduction is evident by the difference in diameter of the pinion 6 and wheel 7 and the proportionate number of teeth with which they are respectively provided. The number of teeth in either case may be varied as desired, according as different degrees of nicety of adjustment as required. I suggest, however, as a satisfactory construction, the provision of, say, one hundred and thirty teeth on wheel 7 and about one tenth of that number on pinion 6. For the sake of clearness I have shown the pinion of greater proportionate size than is desirable and the number of

teeth shown is not the most desirable proportion recommended.

In Fig. 3 I show a modification in which the segment, 4^a, is made in the form of a loop 5 having teeth, 5^a, on the inner edge of the loop, the loop surrounding the pinion 6. There is enough transverse spring in the loop to hold the teeth 5^a in snug engagement with pinion 6 and no longitudinal spring to disturb the adjustment. By this means all 10 lost motion or looseness between segment and pinion is avoided.

What I desire to claim is:—

1. A watch regulator comprising a worm, 15 a wheel meshing therewith, a lever having a segment operated by said wheel, said worm being spring pressed lengthwise.

2. In regulating mechanism for watches, a toothed segmental bar rigid with the regu- 20 lator, a small pinion meshing with said bar, a gear wheel of larger diameter rigid with and concentric with said pinion, a worm shaft, adapted to be engaged by the watchmaker's tool, meshing with said gear wheel and a 25 spring tension device engaging said worm

shaft, substantially as and for the purpose set forth.

3. In regulating mechanism for watches, a toothed segmental bar rigid with the regulator, a small pinion meshing with said bar, a 30 gear wheel of larger diameter rigid with and concentric with said pinion, both of said wheels being pivotally mounted on the cock, a worm shaft, adapted to be engaged by the watchmaker's tool, meshing with said gear 35 wheel and a spring washer mounted on said shaft, substantially as and for the purpose set forth.

4. A watch regulator comprising a worm, a wheel having V shaped teeth meshing 40 therewith, a lever having a segmental rack operated by said wheel, said worm being spring pressed lengthwise.

Signed at Pittsburg Pa., this 19th day of February 1907.

FRANK W. BUCKINGHAM.

Witnesses:

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EDWARD A. LAWRENCE.