(No Model.)

W. B. LEARNED.

CANNON PINION FOR WATCHES.

No. 496,162. Patented Apr. 25, 1893.

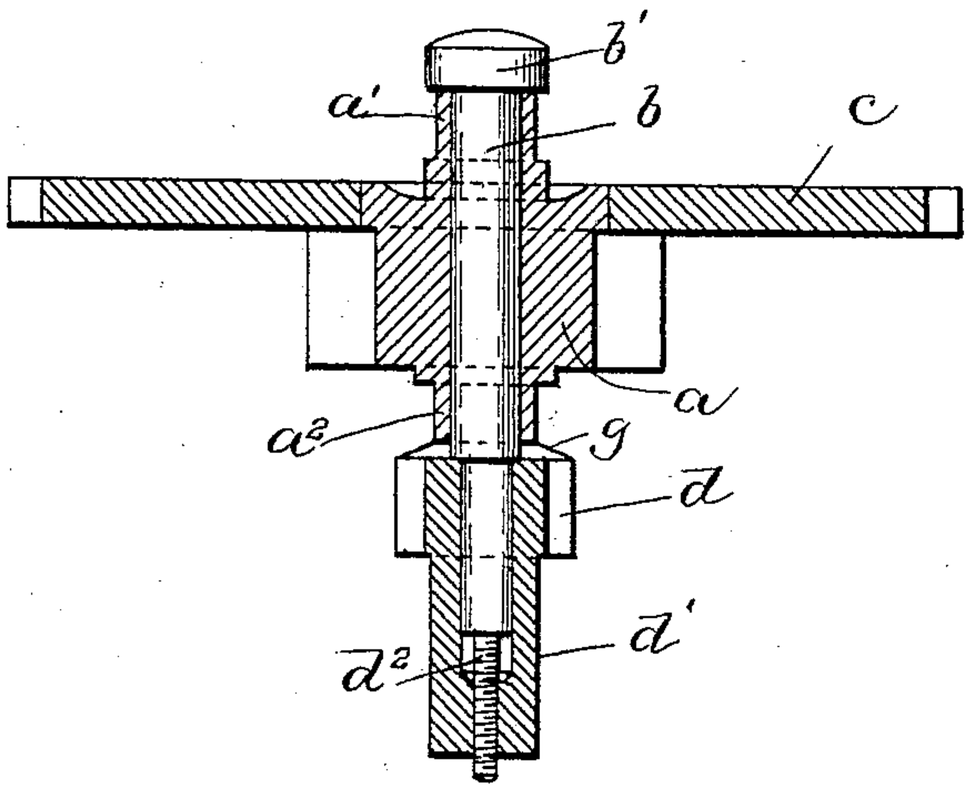

FIG. 1.

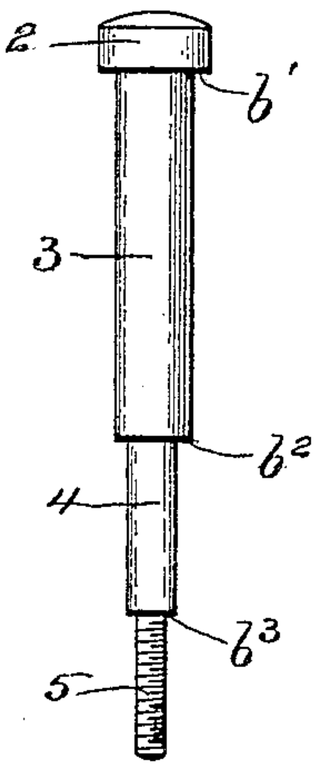

FIG. 3.

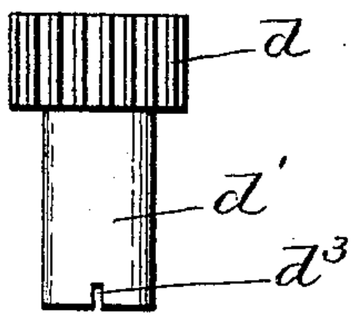

FIG. 2.

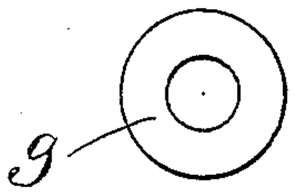

FIG. 4.

WITNESSES:
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W. S. McLeod

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UNITED STATES PATENT OFFICE.

WILLIAM B. LEARNED, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO THE E. HOWARD WATCH AND CLOCK COMPANY, OF SAME PLACE.

CANNON-PINION FOR WATCHES.

SPECIFICATION forming part of Letters Patent No. 496,162, dated April 25, 1893.

Application filed September 1, 1892. Serial No. 444,712. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. LEARNED, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Cannon-Pinions for Watches, of which the following is a specification.

This invention relates to means for frictionally connecting the cannon pinion with the center pinion of a watch movement, particularly in watches in which the hands setting mechanism is operated by the rotation of the winding bar or stem. In this class of watches several difficulties relating to the connection between the cannon pinion and center pinion have been encountered, among which are the following: First, the tendency of the cannon pinion to rise upon its staff during the hands setting operation, and thus move out of engagement with the hands setting train. Secondly, the difficulty of securing the necessary amount of friction on the cannon pinion to drive the hands and yet permit the free setting movement of the hands by the cannon pinion. If the friction be insufficient the motion train will remain stationary, while the time train keeps running. On the other hand, if the friction be too strong there is liability of injury to parts of the watch in setting the hands.

My invention has for its object to overcome the above mentioned difficulties and to provide a cannon pinion so constructed that it can be placed in proper position and its position thoroughly adjusted without endangering the safety of the center jewels in a watch provided with a jeweled center pinion.

To these ends my invention consists principally in the combination with a cannon pinion having an internally threaded bore, of a center pinion, the staff or arbor of which has an external screw thread adapted to engage the internal thread of the cannon pinion, so that by the rotation of the cannon pinion the latter is drawn onto the staff or arbor in the right position to properly connect with the hands setting train.

To obviate any possible chance of the cannon pinion being unscrewed or lifted from the shoulder of the staff or arbor, I have placed a saucer spring or friction washer, which has a bearing on the cannon pinion, near the periphery of the same, thus preventing any tendency of the cannon pinion to start from its seating, but allowing the washer to turn with the cannon pinion on its bearing on the end of the pivot, all of which I will now proceed to describe.

Of the accompanying drawings forming a part of this specification, Figure 1 represents a sectional view of the cannon pinion, center pinion and center wheel in place on the center arbor. Fig. 2 represents a side elevation of the cannon pinion. Fig. 3 represents a side elevation of the center arbor. Fig. 4 represents a plan view of the friction spring or washer.

The same letters and numerals of reference indicate the same parts in all of the figures.

In the drawings a represents the center pinion of a watch movement, the same being hollow or provided with a central bore for the reception of the center arbor b, and provided with the tubular pivots a' a^2 projecting from opposite sides of the pinion, the pivot a' having a rigid bearing on a shoulder b' formed on the center arbor, while the pivot a^2 has a yielding bearing on the friction spring or washer hereinafter described. The center wheel c is affixed to the pinion a in the usual or any suitable manner.

d represents the cannon pinion, the staff or body d' of which extends below the toothed portion of the pinion. The cannon pinion has a longitudinal bore formed to receive the portion of the center arbor that projects from the pivot a^2, and the lower portion of said bore is provided with an internal screw thread which is formed in the reduced portion of said bore below the shoulder d^2. The center arbor comprises the enlarged upper end or head 2 having the shoulder b', the portion 3 that fits the bore of the center pinion and terminates in a shoulder b^2, the portion 4 which fits the bore of the cannon pinion above the shoulder d^2 and terminates in a shoulder b^3, and the screw threaded portion 5 which is formed to engage the internal thread of the cannon pinion. The lower end of the staff d' of the cannon pinion is preferably provided with slots d^3 for en-

gagement with a forked screw driver, whereby the cannon pinion may be screwed onto the threaded portion 5 of the center arbor, until the upper end of the cannon pinion comes to a bearing on the shoulder b^2. The total length of the center pinion or, in other words, the distance between the outer ends of the pivots a' a^2 is less than the distance between the shoulders b' b^2 on the center arbor, so that after the cannon pinion has been screwed to place on the center arbor there will be a space between the cannon pinion and the pivot a^2. In this space is placed a spring washer composed of a cupped metal ring of the form shown in plan in Fig. 4 and in section in Fig. 1, said washer being preferably of tempered steel and formed so that its outer edge or margin bears on the end of the cannon pinion near the periphery of the latter, its inner end bearing on the end of the pivot a^2. The spring washer is compressed or partially flattened when the cannon pinion bears on the pivot a^2 and, therefore, in its effort to assume its normal position presses the pivot a' against the shoulder b' and exerts pressure in the opposite direction on the cannon pinion, said pressure preventing the cannon pinion from being turned on the arbor, excepting by the application of a tool to the cannon pinion, hence there is no liability of accidental displacement of the cannon pinion. The pressure of the spring washer on the center pinion is sufficiently strong to insure the rotation of the center pinion and wheel with the center arbor when the watch is running normally, and at the same time sufficiently yielding to permit the independent rotation of the cannon pinion in setting the hands without injurious strain on the other parts of the movement.

I claim—

1. A cannon pinion having an internally threaded bore adapted to engage a corresponding thread on a center arbor, as set forth.

2. A center arbor having shoulders of different diameters, one adapted to support one of the pivots of a hollow center pinion and the other to support a hollow cannon pinion, said center arbor having also a screw threaded portion to engage an internal thread in the cannon pinion, as set forth.

3. The combination of a center arbor having two shoulders and a screw threaded portion, a hollow center pinion having tubular pivots formed to bear upon the center arbor between said shoulders, a cannon pinion having a screw threaded bore formed to engage the threaded portion of the center arbor, and a friction spring interposed between the cannon pinion and one of the pivots of the center pinion, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 18th day of August, A. D. 1892.

WILLIAM B. LEARNED.

Witnesses:
C. F. BROWN,
A. D. HARRISON.