

No. 753,584.

PATENTED MAR. 1, 1904.

E. F. O. KLEIN.
WATCH MAINSPRING.
APPLICATION FILED JAN. 29, 1903.

NO MODEL.

Fig. 1.

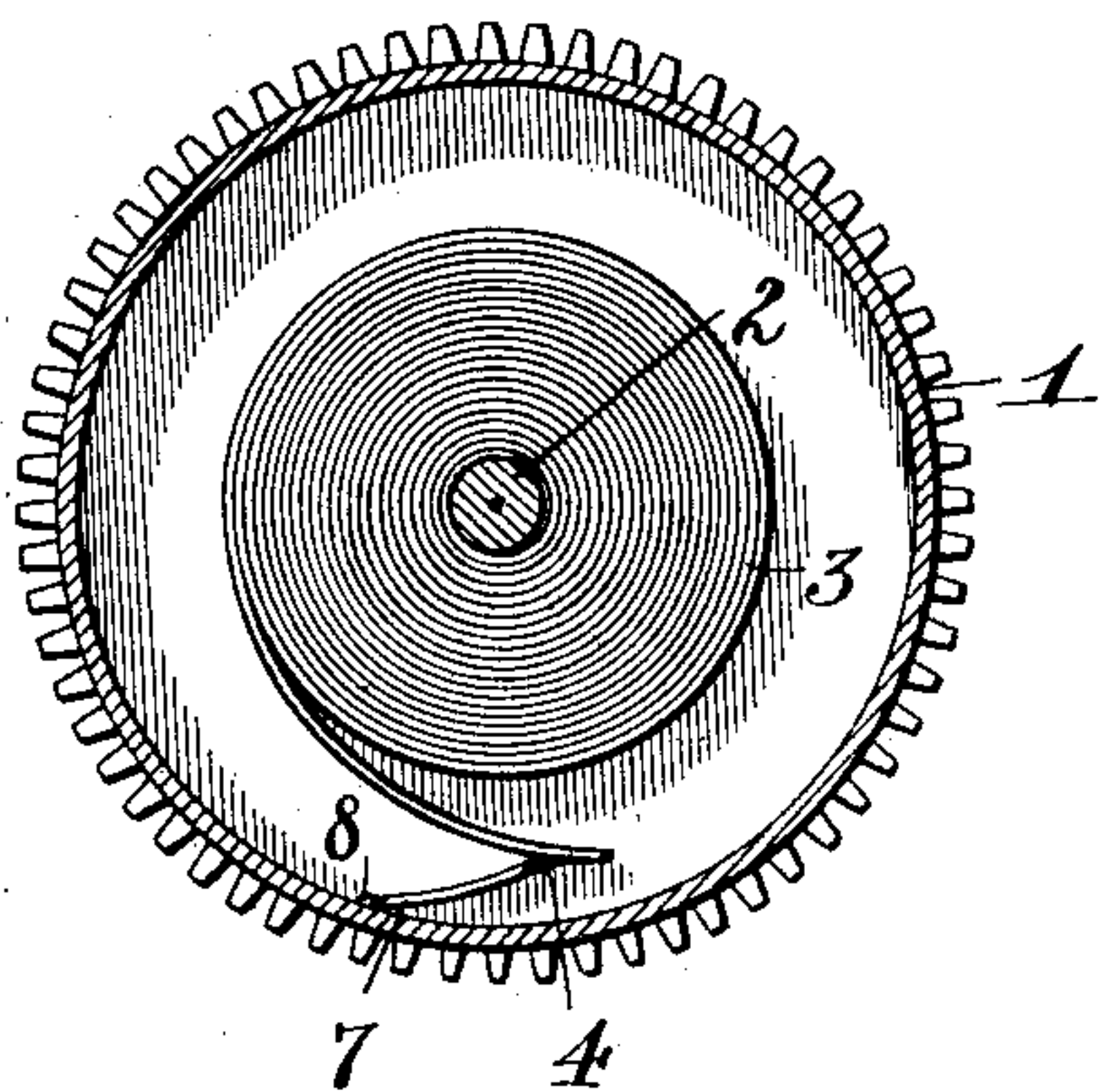


Fig. 2.

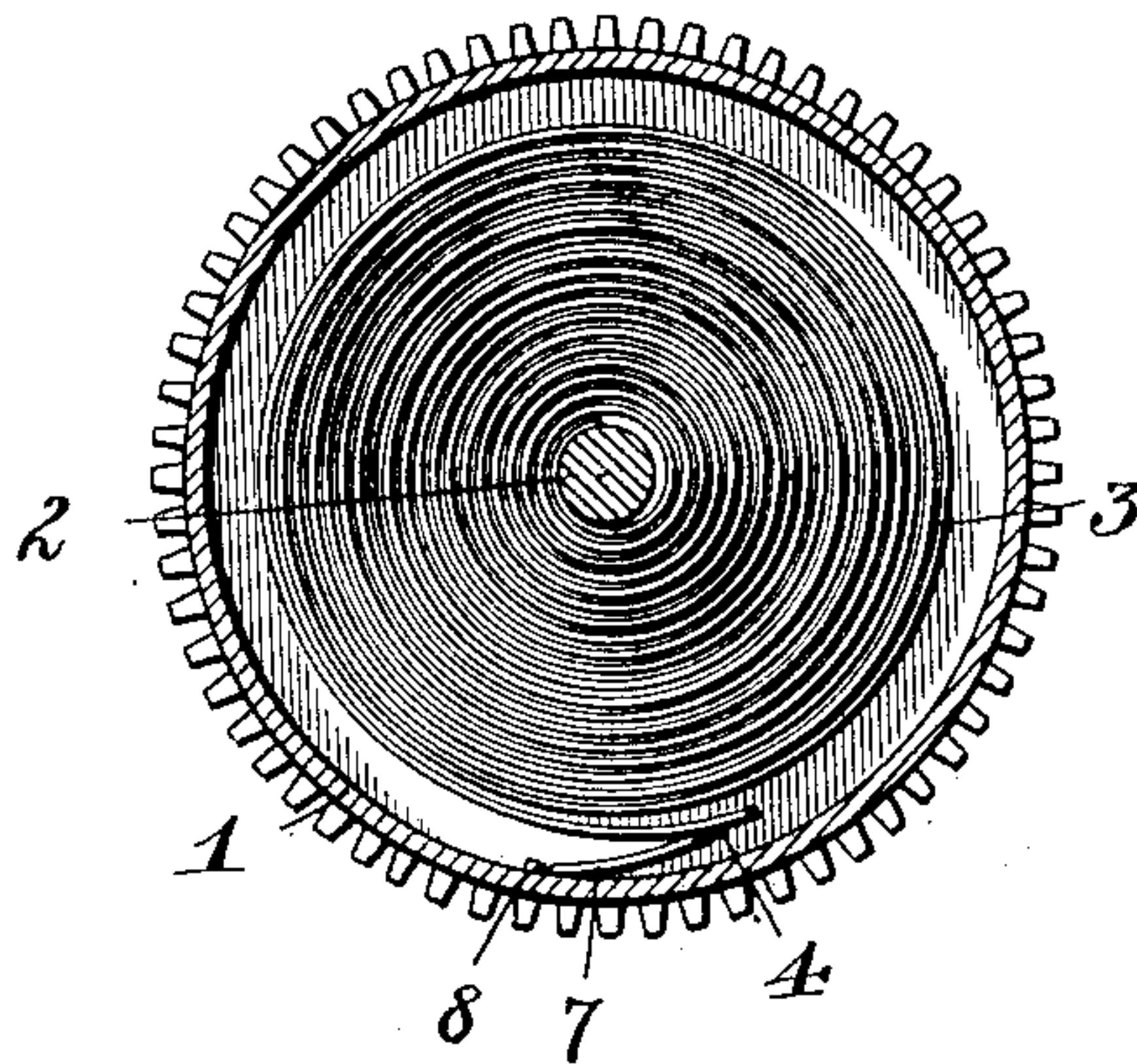


Fig. 3.

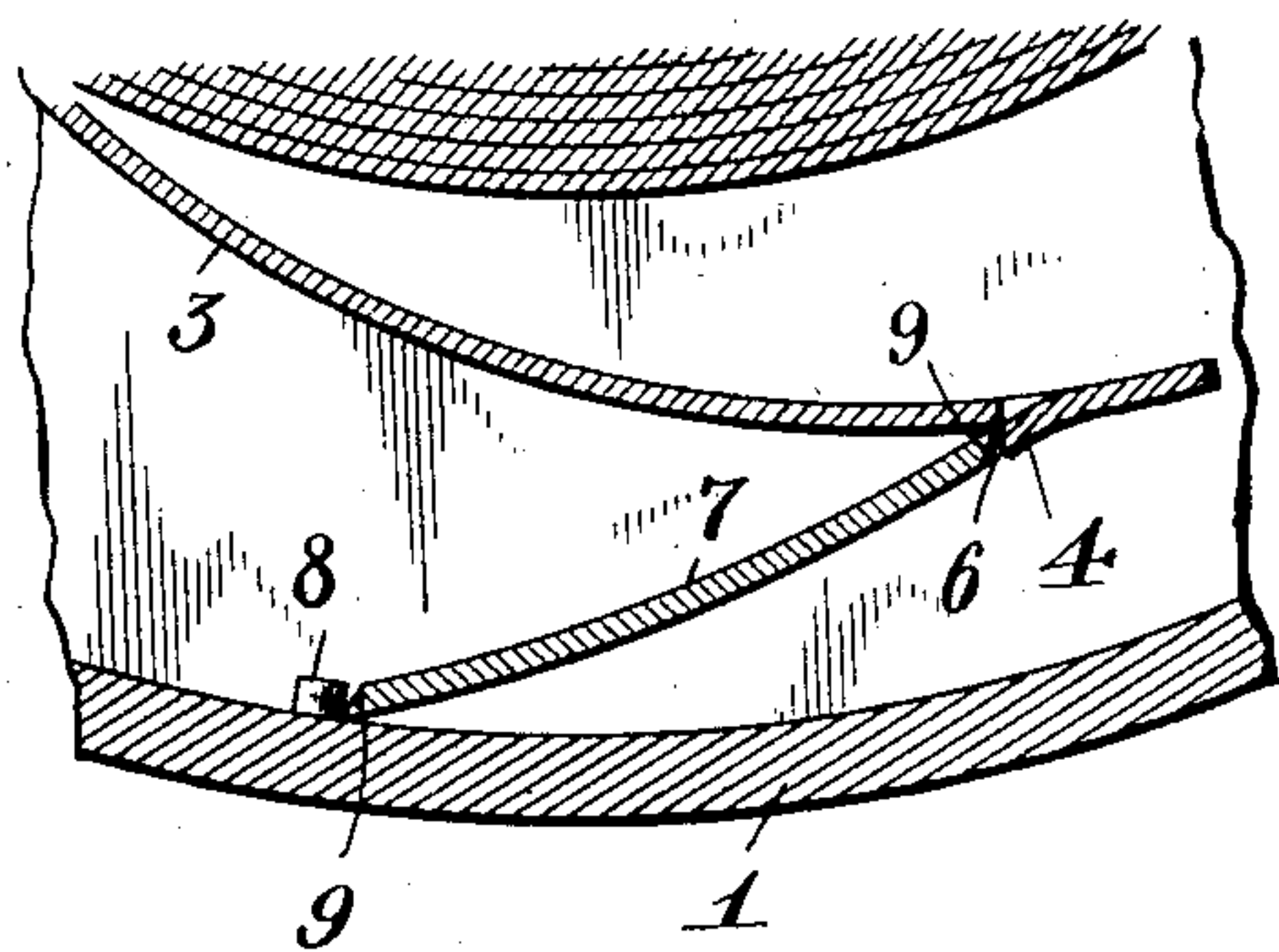


Fig. 4.

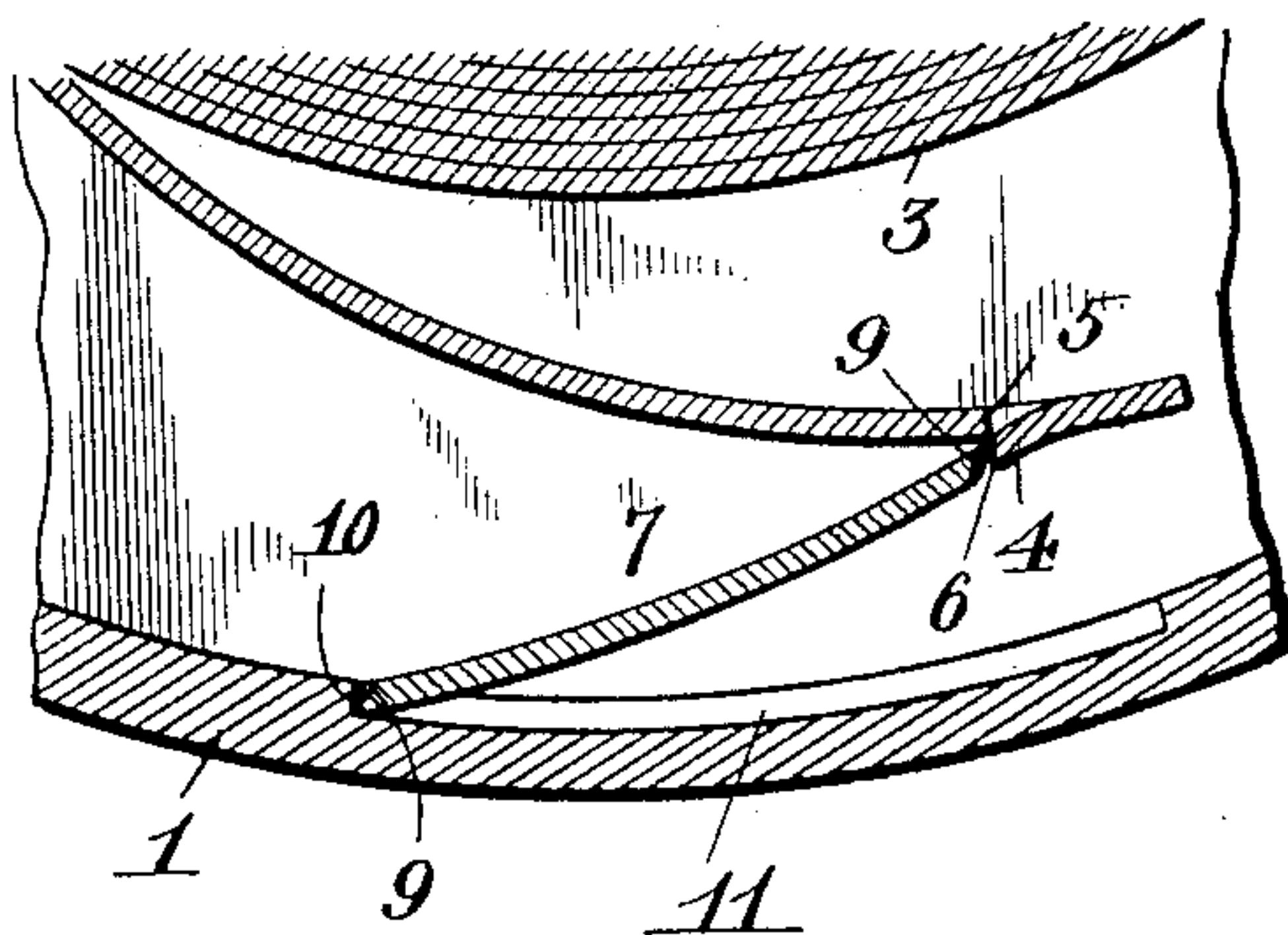


Fig. 5.

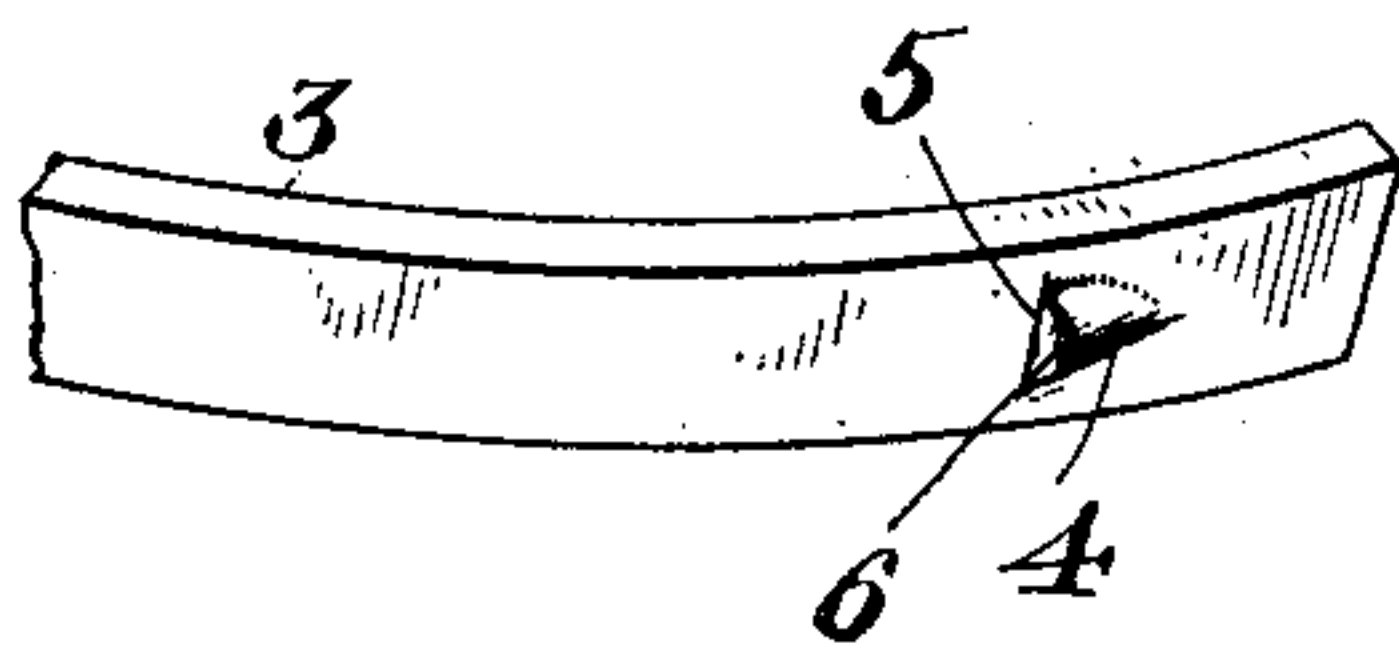
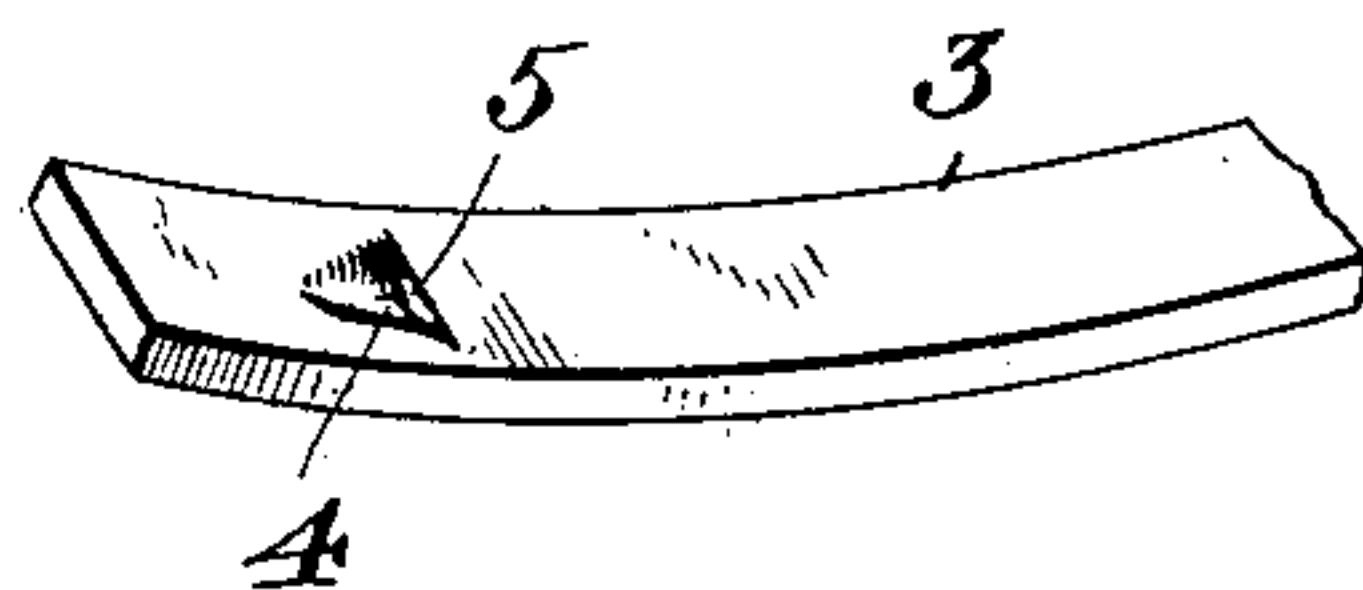


Fig. 6.



Witnesses:
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UNITED STATES PATENT OFFICE.

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WATCH-MAINSRING.

SPECIFICATION forming part of Letters Patent No. 753,584, dated March 1, 1904.

Application filed January 29, 1903. Serial No. 140,995. (No model.)

To all whom it may concern:

Be it known that I, ERNEST F. O. KLEIN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Watch-Mainsprings, of which the following is a specification.

My invention relates to mainsprings for watches, and more particularly to the manner of connection thereof to the spring-barrel; and it has for its object the production of a simple, reliable, and flexible connection between the spring and its containing-barrel which will adjust itself to any angle to conform to the line of draft which is constantly changing, due to the gradual unwinding of the spring and to the winding up of the same, to provide an inexpensive spring which can be quickly and conveniently attached and detached and which is provided with a projection or barb with which a flexible retaining-piece is held in engagement at all times irrespective of the angle of the line of draft thereon or the tension of the spring, to permit the outer end of the spring to move toward and from the confining-wall of the barrel and when unwound to cause the outer convolution of the spring to conform to the confining-wall, and also to prevent twisting of the outer convolution at all times and under all conditions to which the spring is subjected.

To these ends the invention consists of the new and novel construction of the spring and of the new and novel arrangement and combination of parts, as will be hereinafter described, and particularly pointed out in the subjoined claim.

In the drawings, Figure 1 is a sectional plan of a spring-barrel having my improved main-spring held therein, said spring being wound up. Fig. 2 is a similar view showing the main-spring partially unwound. Fig. 3 is an enlarged sectional view of a portion of the spring and barrel. Fig. 4 is a similar view showing the connection to the barrel in a modified form. Fig. 5 is a perspective view of the outer end of the spring, showing the outer face thereof. Fig. 6 is a similar view of the outer end of the spring, showing the inner face thereof.

Referring to the drawings in detail, like

numerals of reference refer to like parts in the several figures.

The reference-numeral 1 designates the spring-barrel, which is geared to and designed to actuate the various parts of the watch-movement, as is common. A winding-arbor 2 passes through the spring-barrel and has the inner end of the mainspring 3 attached thereto. The said spring is provided near its outer end with an undercut projection or barb 4, which is formed by cutting transversely through the spring, as at 5, and bulging the same outwardly on that side of the incision nearest the end, thus forming an abutment 6, which is preferably filed to form an undercut face. If desired, the incision 5 may be made slanting, in which case the projection or barb would be undercut without the necessity of filing the same. By arching the abutment a strong and rigid construction is obtained which cannot be distorted or effected in its efficiency when the spring is twisted slightly and the line of draft is changed accordingly.

A flexible retaining-piece 7 abuts with one end against a pin or stud 8, projecting from the inner face of the wall of the barrel, and with its other end against the undercut free edge of the projection or barb 4. This arrangement permits the said retaining-piece to move toward and from the circumferential wall of the barrel to adjust itself to the condition of the spring. That end of the retaining-piece bearing against the stud 8 serves as a fulcrum to permit the same to oscillate, while the tension of the spring holds the ends of the same firmly against the stud 8 and the projection or barb 4.

By preference the ends of the retaining-piece are beveled, as at 9, to securely engage the stud 8 and the projection or barb 4 and to allow sufficient play to permit the same to oscillate and adjust itself to the various conditions of the spring.

In the modification shown in Fig. 4 the pin or stud 8 is dispensed with and the barrel end of the retaining-piece abuts against the end defining-wall 10 of a segmental groove 11, formed in the inner face of the barrel and adapted to receive the entire retaining-piece when the spring is unwound.

By arranging the projection near the outer end of the spring instead of at the outer end, as has heretofore been the practice, there is absolutely no possibility of the spring breaking when wound up. This applies particularly to fine springs such as are used on small ladies' watches, and it also prevents buckling or twisting of the spring, as the line of strain will always conform itself to the curvature of the spring irrespective of what its condition may be.

Having thus described my invention, what I claim is—

The combination with the spring-barrel, of a mainspring held therein and having an undercut projection stamped therefrom near its

outer end, said projection being formed by cutting a transverse incision and bulging the metal outwardly on that side of the incision nearer the outer end of the spring and undercutting the elevated edge thereof, and a retaining-piece having one end edge beveled and adapted to engage the undercut projection and its other end held to the spring-barrel.

In witness whereof I have affixed my signature in the presence of two subscribing witnesses.

ERNEST F. O. KLEIN.

Witnesses:

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EMIL NEUHART.