C. I. EARLL.

SPRING.

APPLICATION FILED DEC. 26, 1913.

1,138,738. Patented May 11, 1915.

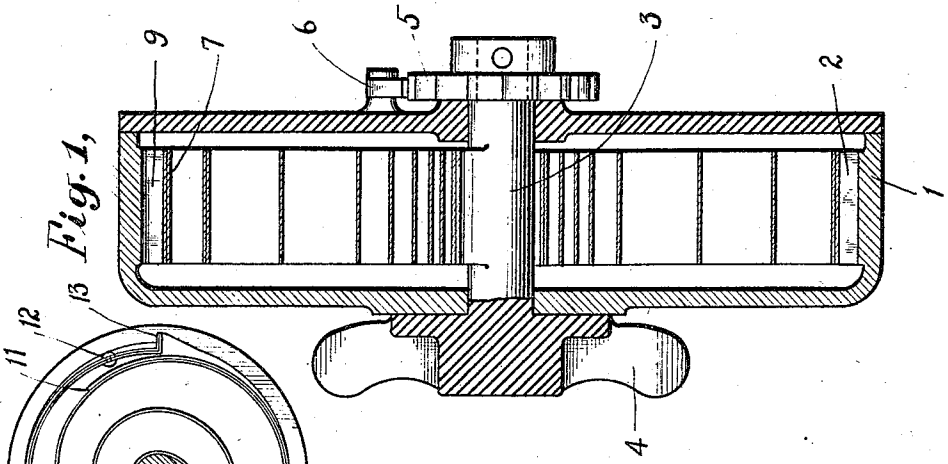
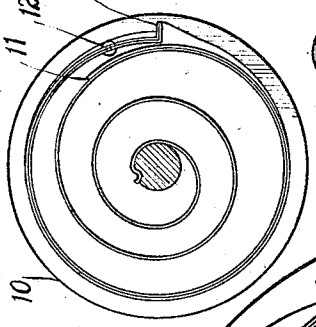


Fig. 1.



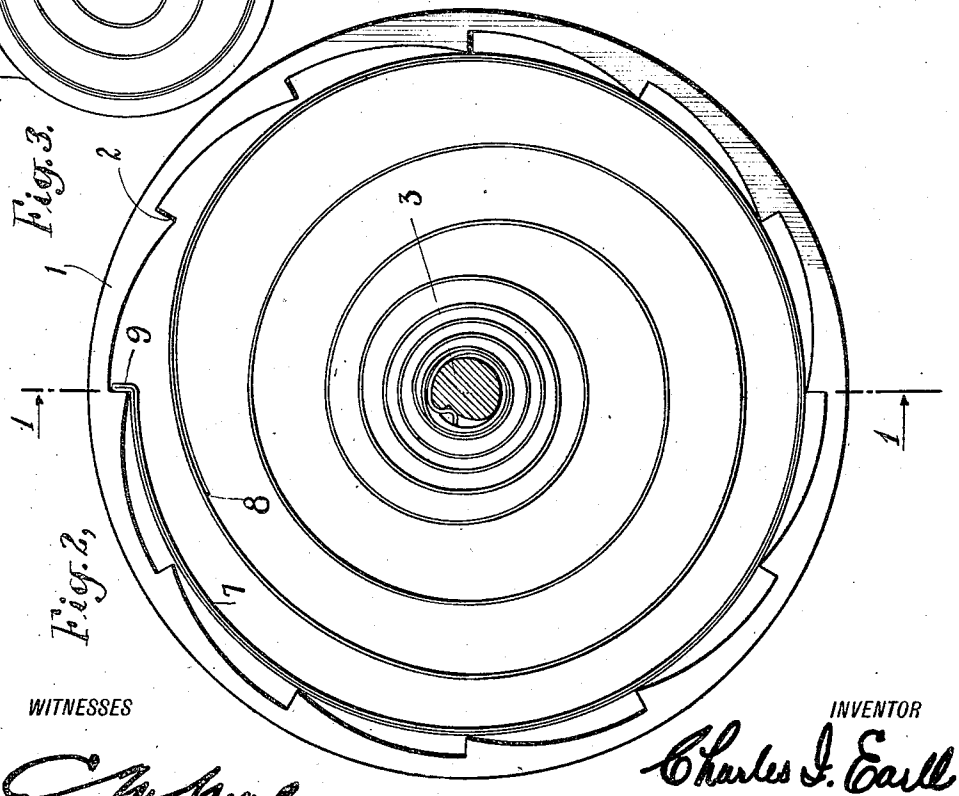


Fig. 3.

Fig. 2.

WITNESSES

Ernest Miller

INVENTOR

Charles I. Earll

UNITED STATES PATENT OFFICE.

CHARLES I. EARLL, OF NEW YORK, N. Y.

SPRING.

1,138,738. Specification of Letters Patent. Patented May 11, 1915.

Application filed December 26, 1913. Serial No. 808,695.

To all whom it may concern:

Be it known that I, CHARLES I. EARLL, a citizen of the United States of America, and resident of the city, county, and State of New York, have invented certain new and useful Improvements in Springs, of which the following is a specification.

My invention relates to springs and particularly to the class of springs known as true spiral or clock springs.

The object of my invention is to provide a spring of this class in which the mode of attachment for the outer end of the spring shall be simple and effective, and one in which rivets or pins or similar devices for securing the spring at its outer end to the spring case are avoided, and one in which breakage from overwinding is prevented.

My invention consists in folding back the outer end of the spring upon itself either upon the inside or the outside of the outer coil, but preferably upon the inside, and in forming a hook or securing means at the end of the folded portion by bending said end outwardly in the form of a hook or projection. By means of this construction a simple lug or projection in the interior of the spring case is sufficient to adequately hold the spring to the case, and, at the same time if the spring is wound to a pre-determined point the hook end will slip out of engagement and will unwind or slip until the same or another projection is encountered by the hook.

In the drawings accompanying and forming part of this specification Figure 1 is a transverse section through a spring case and spring embodying the preferred form of my invention; Fig. 2 is a section at right angles to Fig. 1; and Fig. 3 shows a modified form.

I have not shown the spring as applied to any particular kind of mechanism as springs of this character are used for a great variety of purposes, and my invention is applicable to practically any case where a long relatively thin spiral spring may be employed.

Numeral 1 represents a spring case provided with internal teeth or projections 2; at the center of the case I have shown the arbor 3 upon which the spring is wound; the arbor has wings 4 by means of which the arbor is turned, and a ratchet 5 and pawl 6 are secured to the arbor and to the case respectively to lock the spring. The outer end of the spring is formed by having a portion 7 folded back or turned inwardly upon itself and preferably to a point 8 a little more than one convolution of the spring when it is relaxed and lies against the periphery of the case. A hook 9 is formed at the end and engages a tooth or projection 2. The effect of the inner portion 7 is to keep an outer coil of the spring pressed outwardly against the case with the combined strength of the two thicknesses of the spring and the strength of the hook portion 9 is much greater than where the hook is formed to a single portion of the spring as is frequently done.

In the modified form shown in Fig. 3 the portion 10 which is folded back is folded upon the outside of the outer coil instead of the inside. In this case it is essential that the end 11 shall pass around for more than one convolution of the spring, and in this case also I prefer to put a small rivet 12 some distance back of the hook 13.

The teeth 7 of the case may be made radial or inclined either to one side or the other of a radial line as circumstances may require, and the hook 9 may be bent at any angle which suits the conditions of any particular case.

I have found that where springs such as those used in trolley catchers and trolley retrievers where the spring is from fifteen to twenty thousandths of an inch thick and about twenty feet long that a radial projection or tooth in the case is effective to hold the spring until it is completely wound up, and at the same time the hook readily slips or disengages from the tooth without breaking or injuring the spring in case the effort is made to overwind the spring.

Having thus described my invention what I claim is:—

1. A coiled spring having its outer end folded or turned back upon the adjacent portion and an outwardly projecting hook formed at the junction of the folded portion and said adjacent portion.

2. A flat spiral coiled spring having an outer end portion folded or turned back upon the inside of the adjacent portion and an outwardly extending hook or engaging projection at the junction of said portions.

3. A flat coiled spring having an outer end portion folded or turned back upon the inside of the adjacent portion and an engaging projection formed at the junction of said portions by an outward bend at said junction.

4. The combination with a member having an annular recess provided with an inwardly extending projection in its periphery, of a spring in said recess having an outer end portion folded or turned back upon the adjacent portion and a hook formed at the junction of said portions adapted to engage the projection in said recess.

5. The combination with a member having an annular recess provided with an inwardly extending projection in its periphery, of a spring in said recess having an outer end portion folded or turned back upon the adjacent portion and a hook formed at the junction of said portions, said outer end portion being of a length sufficient to press said hook outwardly against the inner periphery of said recess.

6. A coiled spring of the type described having a portion of its outer end, the length of said portion being about the length of one of the outer coils of said spring, folded or turned back upon the adjacent portion, and an outwardly extending hook formed at the junctions of said portions.

7. A coiled spring of the type described having a portion of its outer end, the length of said portion being about the length of one of the outer coils of said spring, folded or turned back upon the inside of said adjacent portion, and an outwardly extending hook formed at the junction of said portions.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES I. EARLL.

Witnesses:
C. M. WALES,
FLORENCE J. WALSH.