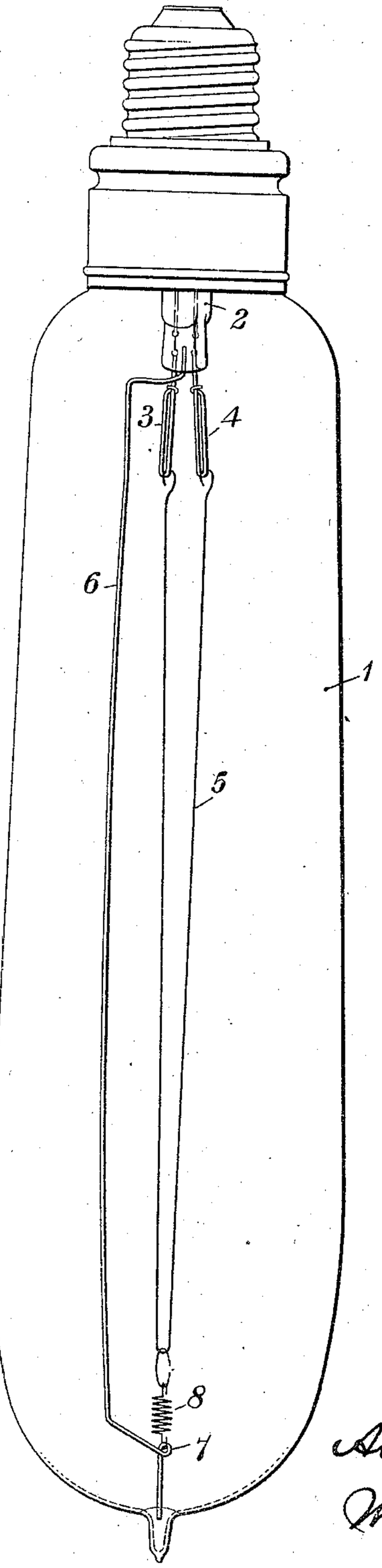
A. S. KNIGHT.

INCANDESCENT LAMP.

APPLICATION FILED JULY 19, 1909.

985,422.

Patented Feb. 28, 1911



WITNESSES:

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INCANDESCENT LAMP.

985,422. Specification of Letters Patent. **Patented Feb. 28, 1911.**

Application filed July 19, 1909. Serial No. 508,543.

To all whom it may concern:

Be it known that I, ARTHUR S. KNIGHT, a subject of the King of Great Britain, and a resident of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Incandescent Lamps, of which the following is a specification.

My invention relates to incandescent lamps, and particularly to supporting means for the filaments thereof.

The object of the invention is to provide simple and effective means for so supporting lamp filaments that they may withstand severe shocks and vibrations without breakage, and may expand and contract freely without subjection to undue strains.

By reason of the crystalline and brittle character of metallic tungsten, filaments that are manufactured therefrom for use in incandescent lamps are extremely fragile, and it is accordingly necessary to very carefully mount them in lamps in order that they may withstand shocks and vibrations and changes in length resulting from heating, cooling and aging without subjection to undue strains and breakage.

It has heretofore been proposed to provide lamps with U-shaped or reversely bent filaments the ends of which are connected and secured to terminal leads, and to support the filaments at the bights thereof by means of resilient members or anchors that are mounted in the stems or arbors of the lamps. Such a construction, however, is not satisfactory or entirely practical for lamps in which very long filaments are employed for the purpose of obtaining high candle power, because the high degree of heat developed draws the temper of the resilient supporting members or anchors, and also for the reason that anchors of reasonable size are not sufficiently stiff to prevent undue vibrations of the filaments. The present supporting device for the filament overcomes the above stated objections, and is especially adapted for use in lamps in which very long filaments are employed.

The invention is illustrated in the accompanying drawing, the single figure of which is a side view of a lamp constructed in accordance therewith.

Projecting in the usual manner into the bulb 1 of the lamp is a stem 2 through which extend terminal wires or leads 3 and 4, the inner ends of which are attached and electrically connected to the ends of a reversely bent or U-shaped filament 5. Mounted in the flattened end portion of the stem 2, between the leads 3 and 4, is a supporting member or anchor 6 for the filament, that extends substantially from end to end of the bulb alongside of the filament and the end of which projects into the tip of the lamp for the purpose of limiting its vibrations and lateral movements. Near its free end, the anchor is bent toward the axis of the bulb and is provided with a loop 7 in which one end of a helical spring 8 is hooked, the other end of the spring being hooked in a link, preferably composed of tungsten, that is, in turn, attached to the filament 5. The spring 8 is normally under tension, thus maintaining the filament taut and permitting of its expansion and contraction, and it is preferably composed of platinum, iridium, or other material the temper of which is not affected by the temperature to which it is subjected during the operation of the lamp. When thus supported, the liability of breakage of the filament is reduced to a minimum, since vibrations of the filament are both limited and cushioned, and expansion and contraction thereof are freely permitted.

I claim as my invention:

1. An incandescent lamp comprising a bulb having a tip and a stem at its opposite ends, terminals projecting from the stem into the bulb, a reversely bent filament connected at its ends to the terminals, an anchor or supporting member carried by the stem and extending into the tip of the lamp, and resilient means interposed between the end of the anchor and the bight of the filament.

2. An incandescent lamp comprising a bulb having a tip and a stem at its opposite

ends, terminals projecting from the stem into the bulb, a reversely bent filament connected at its end to the terminals, an anchor or supporting member carried by the stem and extending into the tip of the lamp, and a helical spring interposed between the end of the anchor and the bight of the filament.

In testimony whereof, I have hereunto subscribed my name this 7th day of July, 1909.

ARTHUR S. KNIGHT.

Witnesses:

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