

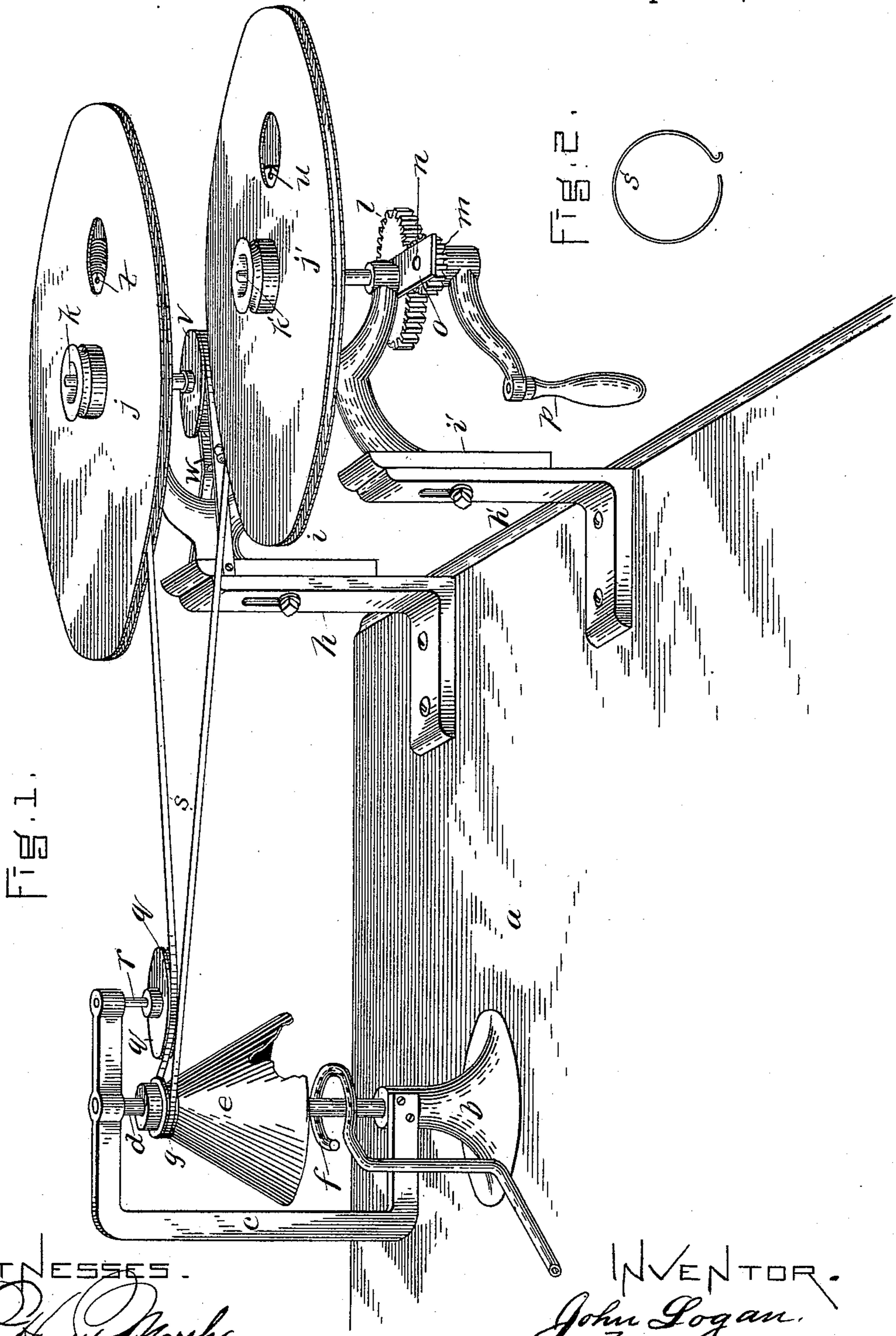
(No Model.)

J. LOGAN.

APPARATUS FOR COLORING WATCH SPRINGS.

No. 459,914.

Patented Sept. 22, 1891.



WITNESSES.  
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# UNITED STATES PATENT OFFICE.

JOHN LOGAN, OF WALTHAM, MASSACHUSETTS.

## APPARATUS FOR COLORING WATCH-SPRINGS.

SPECIFICATION forming part of Letters Patent No. 459,914, dated September 22, 1891.

Application filed December 29, 1890. Serial No. 376,017. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN LOGAN, of Waltham, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in the Means for Coloring Watch-Springs or Spring Material, of which the following is a specification.

It is the object of the invention to provide such improvements in the means for coloring watch-mainsprings as will secure a similarity of color to both sides and a uniformity in the color throughout the length of the spring and also "set" or fix its form or curvature, and at the same time avoid any scratching or abrading of the spring.

Heretofore the coloring of watch-mainsprings has usually been done by drawing the same over a stationary hood or flat surface of iron heated by a flame therebeneath. Objections to this mode of procedure arise from the fact that it results in a scratching or abrasion of the spring material, and it is quite difficult, if not impossible, to secure a similar bluing or coloring to both sides of the spring or a uniform coloring throughout its length.

My invention overcomes the objections and difficulties before mentioned, the said invention consisting in passing the spring material around a circular or cylindrical rotary heated surface, whereby abrasion of the said material is entirely avoided, and a uniform color throughout its length and similar on both sides is secured, and, moreover, the curvature is set or fixed, so that in coiling the spring in a direction opposite the fixed curvature it is made to possess enhanced resilient properties.

The invention will first be described in connection with the annexed drawings and letters of reference marked thereon, forming a part of this specification, and then be pointed out in the claims.

In the drawings, Figure 1 is a perspective view of the invention complete, a portion of one part being broken away. Fig. 2 is a diagram designed to illustrate the manner in which the curvature of the spring is fixed or set in its treatment in accordance with the invention.

In the drawings, *a* designates a table or other support suitable for sustaining and per-

mitting of the operation of the improved means.

*b* designates a stand secured to the table *a*, to which stand there is connected a bracket *c*, provided in its upper arm with a bearing for supporting the upper end of a shaft *d*, stepped at its lower end in the stand *b*, the said shaft *d* being so supported as that it may be rotated.

Connected with the shaft *d* toward the upper end thereof is a stove or heater *e* of conical or frusto-conical form, beneath which there is arranged a gas or other burner *f*, which may be ignited to produce a flame to heat the stove *e*.

The stove has a small section of its exterior made cylindrical or in the form of a pulley, as at *g*, for a purpose to be presently explained.

*h h'* designate brackets connected with the table *a*, and which support other brackets *i i'*, adjustably attached thereto.

*j j'* designate bobbins connected with spindles *k k'*, adjusted so as that they may be rotated in the brackets *i i'*. A gear-wheel *l* is connected with the lower end of spindle *k'*, which gear meshes with a pinion *m*, having a journal *n* supported in a rotary manner in an extension *o* of bracket *i'*, and a crank *p* is connected with gear *m*, so that the latter, the gear *l*, and bobbin *j'* may be rotated. A suitable friction-brake is applied to the reel *j*.

As shown in Fig. 1, a disk *v* is secured to the spindle *k*, and a friction-strap *w*, having its ends suitably secured to the bracket *i*, surrounds and presses against the periphery of the disk *v*.

*q* designates a pulley supported so that it may rotate on a spindle *r*, connected with the upper arm of bracket *c*. The cylindrical or pulley part *g* of the stove, the pulley *q*, and the bobbins *j j'* are arranged upon the same plane.

The operation of the invention is as follows: The wire or spring material *s* to be blued or colored is led from the barrel *t* of the bobbin *j*, upon which it is wound, to the pulley *q*, from thence around the pulley part *g* of the stove, and from thence to the barrel *u* of the bobbin *j'*, to which last-mentioned barrel the material is secured. The burner

5 *f* will be ignited, so as to heat the stove and  
 its connected parts to the requisite degree,  
 when the bobbin *j'* and its barrel *u* will be  
 rotated through the medium of gears *l m* and  
 crank *p*, unreeling the material *s* from the  
 bobbin *j* and winding it upon the bobbin *j'*.  
 The material in passing around the cylindri-  
 cal part *g* of the stove will be uniformly  
 heated and colored on both sides and through-  
 10 out its length, and the said material will act  
 upon the stove as a driving-band, rotating  
 the said stove and avoiding any drag or other  
 action calculated to in any degree scratch or  
 abrade the material. The pulley *q* is pro-  
 15 vided merely as a guide to the passage of the  
 material and for the purpose of bringing it  
 into as great a surface-contact with the cy-  
 lindrical part of the stove as may be. In its  
 passage around the cylindrical part of the  
 20 stove the material will be curved and have  
 its curvature fixed or set, so that if a sec-  
 tion should be cut therefrom it will normally  
 assume the shape shown in Fig. 2. This is  
 an important feature of the invention, since  
 25 in coiling the spring in the direction opposite  
 to its fixed curvature it will have enhanced  
 resilient properties over that it would other-  
 wise have, and its efficiency will be corre-  
 spondingly increased.  
 30 Having thus described the improvement  
 and one form of means by which the same

may be carried into effect, I declare that what I claim is—

1. The combination, with a hollow rotary  
 heater having its axis vertical and having a 35  
 closed upper and open lower end and pro-  
 vided with a cylindrical or pulley-like upper  
 part around which the wire may pass, of a  
 rotary bobbin or reel for drawing the wire  
 around the cylindrical part of the heater, 40  
 means for rotating the bobbin, and heating  
 means located under the open end of the  
 heater, as set forth.

2. The combination, with the bobbins or  
 reels *j j'*, the spindle of one of which is pro- 45  
 vided with a friction-brake and the spindle  
 of the other having means for rotating it, of  
 the frusto-conical heater *e*, having its upper  
 end cylindrical in form, the burner *f*, located  
 under said heater, and the pulley *q* in the 50  
 same plane with the bobbins and the cylin-  
 drical part of the heater, substantially as de-  
 scribed.

In testimony whereof I have signed my  
 name to this specification, in the presence of 55  
 two subscribing witnesses, this 17th day of  
 December, A. D. 1890.

JOHN LOGAN.

Witnesses:

ARTHUR W. CROSSLEY,  
 A. D. HARRISON.