

G. GIN & V. COURTECUISSÉ.  
 DEVICE FOR SINGEING THREADS.  
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923,425.

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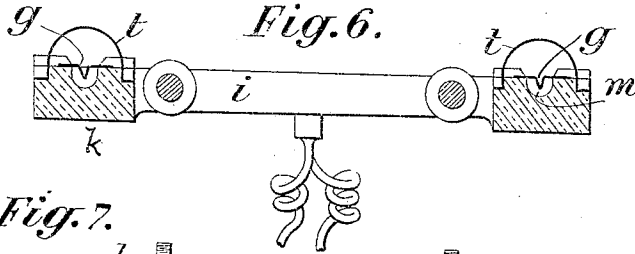
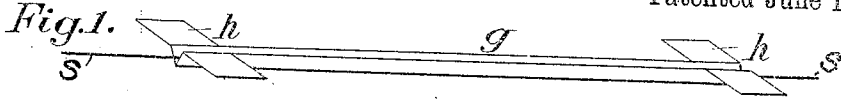


*Fig. 7.*

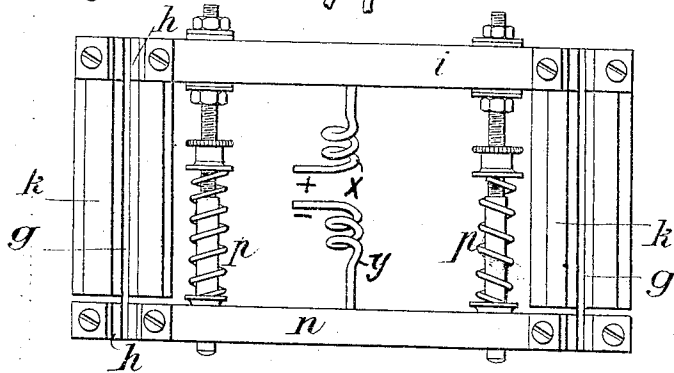


*Fig. 5.*

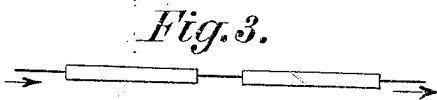
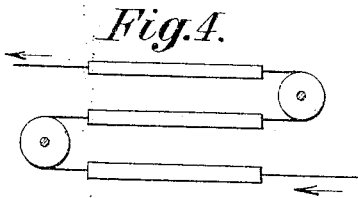
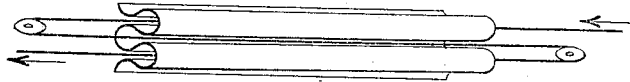
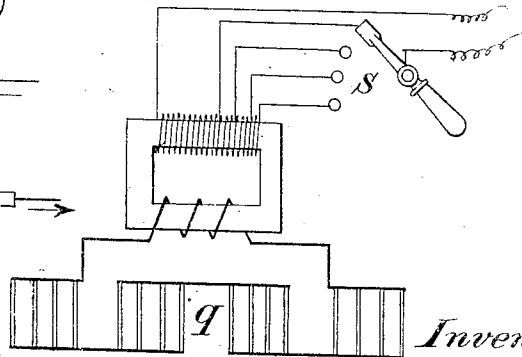


*Fig. 8.*



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# UNITED STATES PATENT OFFICE.

GUSTAVE GIN, OF PARIS, AND VICTOR COURTECUISSIE, OF LILLE, FRANCE; SAID COURTECUISSIE ASSIGNOR TO SAID GIN.

## DEVICE FOR SINGEING THREADS.

No. 923,425.

Specification of Letters Patent.

Patented June 1, 1909.

Application filed March 22, 1907. Serial No. 363,370.

To all whom it may concern:

Be it known that we, GUSTAVE GIN, of Paris, France, and VICTOR COURTECUISSIE, of Lille, France, both citizens of the French Republic, have invented certain new and useful Improvements in Devices for Singeing Threads, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 7 is an elevation of an embodiment of some of our improvements, Fig. 6 a transverse section of Fig. 7, including some features not shown in latter, and Figs. 1, 2, 3, 4, 5 and 8 are views of details.

Our invention relates to that class of apparatus in which the singeing is accomplished by moving the thread in close proximity to the surface of, more particularly, a longitudinally extended somewhat tubular or trough-like member, heated to incandescence by passage therethrough of a current of electricity, and the objects of our present invention comprise means for insuring the safeguarding of the thread, enhancing the uniformity and completeness of the singeing of its undesired projecting fibrils, and conveniently regulating the temperature derivable from usually available sources of electrical energy. These objects we attain by our novel devices and combination of devices hereinafter described.

g, Figs. 1, 6 and 7, represents a preferably tubular longitudinally extended electro-conductive member composed of metal not readily fusible or oxidizable at the high temperatures required for singeing, such as preferably platinum, iridium, rhodium, plated nickel or the like. The form of the cross-section of this member may be considerably varied as shown diagrammatically in Fig. 2, a, b, c, d, e, f, in which the internally disposed dot (.) represents a cross-section of the thread, indicated also by s in Fig. 1, and it may also be composed of a plurality of parts as shown in e, f, in which the curved lines diagrammatically indicate cross-sections of two longitudinally extended electro-conductive members supported equidistantly from and in parallelism with the central longitudinal axis of the group represented by the medial dot indicating also the thread, said members being spaced apart as shown to produce a plurality of slots, or openings between them, this construction being of advantage with certain threads requiring ad-

ditional air for proper combustion, but the preferred form is that shown at c, Fig. 2, in which the member is unitary and of tubular or trough-like cross-section, being provided throughout its whole extent with a slot or opening in parallelism with its central longitudinal axis, the essential being that the member by itself, or with adjuncts hereinafter described, shall so far, and so circumferentially and concentrically surround the thread as to insure on all sides thereof a substantially equal temperature; this, in case of substantially semi-tubular members like those illustrated by a and b, Fig. 2, can best be realized by assistance of shields t, to diminish undesirable radiation and drafts, as shown in Fig. 6. The internal diameter of said member, relatively to the diameter of the thread is, as shown, small—a few millimeters in ordinary practice, and it is, as aforesaid, and in all cases provided with at least one slot or opening extending continuously therethrough in parallelism with the central longitudinal axis of said member, which slot, or opening enables the thread, when straight under tension, as shown in Fig. 1, to be inserted into the member bodily and quickly, and likewise so withdrawn, when required, and without changing the temperature of member g. The length of said tubular member should be much greater than its internal diameter. On the other hand the aperture of said slot is, except in cases where shields are used as hereinafter described, preferably no greater than sufficient to admit free introduction and withdrawal of the thread while tensioned as above stated, and without its approaching in transit any nearer to a heated surface than when centrally located in the tube.

Any convenient means are provided to support and propel the thread through the tubular or trough-like members g in the direction of and preferably substantially concentrically with their central longitudinal axes, such centrality being of importance in assisting the desired equality of temperature on all sides of the thread. Such means are, for example, in the present instance, diagrammatically indicated in Figs. 4 and 5, by reels or pulleys on which the thread is reeled or unreel, supported by any convenient devices disposed to insure the desired lineality of the thread, and rotated by any desired means.

The tubular, or trough-like, members are heated to required temperature by passage therethrough of an electric current. Said members are conveniently provided at each extremity with ears *h*, Figs. 1 and 7, with which the requisite electrical contacts may be effected. Said ears are conductors and are secured to conducting bars *i*, *n*, (see Fig. 7) each connected by a conductor, as *x*, *y*, with a source of electrical energy not shown, the required temperatures being attained by resistance of the members *k* when the current is turned on, the current passing from conductor *x* through *i*, *g* and *n* to conductor *y*. Where, as is desirable in practice, a considerable number of said members are heated by the current from a single source, it is preferable to install in parallel a group of several members *g*, Fig. 8, and install in series a number of said groups as shown diagrammatically in Fig. 8, the current being supplied to the extremes through a transformer as shown, which receives the primary current at normal tension, and supplies it to the secondary coil at a tension and volume corresponding to the number and section of all the members and to the required temperature. This temperature will depend upon the number of threads and the speed at which they are propelled through said members. To regulate it the number of turns employed of one or both of the primary, or secondary windings, may be varied by means of a contact stud switch as indicated in Fig. 8. With a sufficient number of contact-studs one may thus produce any required temperature.

In certain classes of threads a more perfect singeing is obtainable by passing them successively through several consecutive tubular or trough-like members disposed in series as shown in Fig. 3, or in parallel with return motion as shown in Fig. 4. Where the latter method is employed, the plurality of tubular or trough-like members may advantageously be constructed out of a unitary sheet of said metal, corrugated to produce the required group of parallel tubular passages, each provided with an opening extending continuously therethrough in parallelism with its central longitudinal axis, as shown in Fig. 5. Where such sequences are employed the thread is alternately highly heated and intermediately subjected to oxidizing action in an atmosphere with particularly advantageous results.

Considering the minute internal diameter of said tubular or trough-like members, the close approximation of the thread to their interior surfaces, and the high temperature of latter when heated, and the very considerable expansions and contractions to which they are necessarily subjected under variations of temperature, it will be appreciated that a highly important condition to

be maintained is that of their constant rectitude and avoidance of buckling thereof. If both extremities of such members are fixedly supported prohibitory buckling is inevitable, with the result that the thread is injured or severed by burning through. We have obviated these difficulties by the expedient of fixedly supporting one end only of said members and movably supporting the other end. One end being thus substantially free, their expansion and contraction are unimpeded and buckling of the said members prevented. If the members are disposed vertically, suspended at their upper ends from a stationary support, their own weight, plus that of the said movable supports at their lower ends will suffice to maintain their rectilineality. If preferred, or when they are horizontally disposed, this required tension may be effected by aid of tensional springs, as, for example, *p* as shown in Fig. 7. In this instance the members *g* are connected by their ears *h* with a stationary supporting electrically conductive bar *i*, to which may be further secured protecting frames *k*, the body of the members *g* being free in the grooves *m* of the latter. The members *g* are by similar ears, at their opposite extremities, secured to the electrically conductive movable supporting bar *n* which is free to reciprocate relatively to the frames *k* but without contacting therewith. Tensional springs *p*, *p*, bear against *n* to constantly press it in a direction outward or away from *i*. Therefore, as the members *g* expand and lengthen under rise of temperature they are positively pulled straight and as they cool they contract against the stress of the springs *p*, and are thereby prevented from buckling.

To avoid undue radiation from the members *g* and undesirable drafts and access of air of relatively low temperature, thus disturbing the desired equality of temperature on all sides of the thread, the members may be covered, or inclosed by screens or shields *t* diagrammatically indicated in Fig. 6, but not shown, for clearness of other parts, in Fig. 7. These inclosing screens or shields may be constructed of any desired form or material consistently with their effective protection of the members and threads in the particulars mentioned.

The delicacy and certainty of operation afforded by our said improvements is such as to enable to be singed, or "gassed" thereby, materials hitherto incapable of such treatment.

What we claim as new and desire to secure by Letters Patent is the following, viz:—

1. An apparatus for singeing thread comprising a longitudinally extended electroconductive member provided with an opening extending continuously therethrough in parallelism with its central longitudinal axis.

means to support and propel the thread through said member in the line of said axis, means for passing a current of electricity through said member for heating the same, and means for supporting movably an end of said member.

2. An apparatus for singeing thread comprising a group of longitudinally extended electro-conductive members supported equidistantly from and in parallelism with the central longitudinal axis of said group, said members being spaced apart to provide openings extending continuously between in parallelism with said axis, means to support and propel the thread through said members in the line of said axis, means for passing a current of electricity through said members for heating the same, and means for supporting movably ends of said members.

3. An apparatus for singeing thread comprising a longitudinally extended electro-conductive member provided with an opening extending continuously therethrough in parallelism with its central longitudinal axis, means to support and propel the thread through said member in the line of said axis, means for passing a current of electricity through said member for heating the same, means for supporting movably an end of said member and means proximate to said opening to obstruct heat radiation therefrom.

4. An apparatus for singeing thread comprising a plurality of spaced apart longitudinally extended tubular electro-conductive members, means to support and propel the thread successively through each of said members in the line of its central longitudinal axis, and means for passing a current of electricity through each of said members for heating the same.

5. An apparatus for singeing thread comprising a longitudinally extended electro-conductive member composed of a sheet of material corrugated to produce a group of parallel tubular passages each provided with an opening extending continuously therethrough in parallelism with its central longitudinal axis, means to support and propel the thread through each said passage in the line of its said axis, means for passing a current of electricity through said member for heating the same, and means for supporting movably an end of said member.

6. An apparatus for singeing thread comprising a longitudinally extended electro-conductive member provided with an opening extending continuously therethrough in parallelism with its central longitudinal axis, means to support and propel the thread through said member in the line of said axis, means for passing a current of electricity through said member for heating the same,

means for supporting movably an end of said member and means for tensioning said member in the direction of its said axis.

7. An apparatus for singeing thread comprising a longitudinally extended electro-conductive member provided with an opening extending continuously therethrough in parallelism with its central longitudinal axis, means to support and propel the thread through said member in the line of said axis, means for passing a current of electricity through said member for heating the same, and a shield disposed externally around said member to increase equality of temperature on all sides of said thread.

8. An apparatus for singeing thread comprising a group of longitudinally extended electro-conductive members supported equidistantly from and in parallelism with the central longitudinal axis of said group, said members being spaced apart to provide openings extending continuously between in parallelism with said axis, means to support and propel the thread through said members in the line of said axis, and means for passing a current of electricity through said members for heating the same.

9. An apparatus for singeing thread comprising an electro-conductive member, means to support and propel the thread in proximity to said member, means for passing a current of electricity through said member for heating the same, and means for supporting movably one end of said member.

10. An apparatus for singeing thread comprising an electro-conductive member, means to support and propel the thread in proximity to said member, means for passing a current of electricity through said member for heating the same, and means for tensioning said member in a direction parallel with that of said propulsion of said thread.

11. An apparatus for singeing thread comprising an electro-conductive member, means to support and propel the thread in proximity to said member, means for passing a current of electricity through said member for heating the same, means for supporting movably one end of said member, and a spring to tension said member in a direction parallel with that of said propulsion of said thread.

In testimony whereof we have hereunto set our hands in presence of two witnesses.

GUSTAVE GIN.

VICTOR COURTECUISSIE.

Witnesses as to Gustave Gin:

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