

UNITED STATES PATENT OFFICE.

HARRY BARRINGER COX, OF HARTFORD, CONNECTICUT.

THERMO-ELECTRIC GENERATOR.

SPECIFICATION forming part of Letters Patent No. 548,038, dated October 15, 1895.

Application filed January 31, 1894. Serial No. 498,657. (No model.)

To all whom it may concern:

Be it known that I, HARRY BARRINGER COX, of Hartford, in the county of Hartford and State of Connecticut, have invented certain
5 new and useful Improvements in Thermo-Electric Generators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable
10 others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention relates to certain improve-
15 ments in thermo-electric generators.

The object of the invention is to provide an improved method of constructing thermo-electric generators, whereby the elements constituting the couples will be most permanently
20 and positively united into a single integral piece by fusing the metals of the elements into an alloy at the point of junction, so that the alloy is homogeneous with the metals of the elements and is gradually shaded off into
25 the same.

The invention consists in the peculiar method hereinafter set forth and fully described.

Heretofore great difficulty has been experienced by reason of the breaking down and separation of the elements composing the thermo-electric couples which constitutes the generator, for various reasons, such as the unequal expansion and contraction of the different
30 elements.

It is the object of this invention to so amalgamate or unite the unlike metals into a single piece as to absolutely prevent this breaking down or rupture at the joints, as in reality no
40 joints are formed, as the metals are fused into a single piece.

It is well understood that thermo-electric generators are generally composed of alternating elements of thin metal strips, such as
45 copper strips, and larger blocks of some softer metal, such as an alloy of antimony and zinc.

In carrying out my invention the elements are fused together by means of electric current in any suitable manner, so that when the

adjacent ends of two unlike elements are in
50 the proper machine to properly apply the electric current and hold the parts the said elements on engagement with each other can be so fused at the meeting points as to form an alloy of the metals of the elements, which
55 will become amalgamated with the elements themselves, and thereby unite the elements into a single piece without the joint or break, and so that there is in reality no line of union between the metals. 60

The copper connecting-strips, which of course have a very high fusing point, are formed very thin and of very small area in cross-section, indeed, in comparison with the corresponding area of the large elements of
65 an alloy of antimony and zinc of comparatively low fusing point. The large element of soft metal is made so much larger than the thin hard metal strip and in such proportion thereto that the current passing through the
70 great area and surface of the large element will be so concentrated onto the small thin strip that at the junction between the large element and a strip both will fuse to form the alloy between them and the graduated alloy
75 junction.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

The method of making thermo electric
80 couples which consists in forming a thin hard metal strip element, and a comparatively large metal element of a lower fusing point than the strip element, then passing an electric current through said large soft metal ele-
85 ment and thin metal strip which are properly proportioned so that the hard metal fuses to the soft metal to form the alloy of the metals of both parts and unite them by graduated alloy junction, substantially as described. 90

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HARRY BARRINGER COX.

Witnesses:

O. E. DUFFY,
C. M. WERLE.