

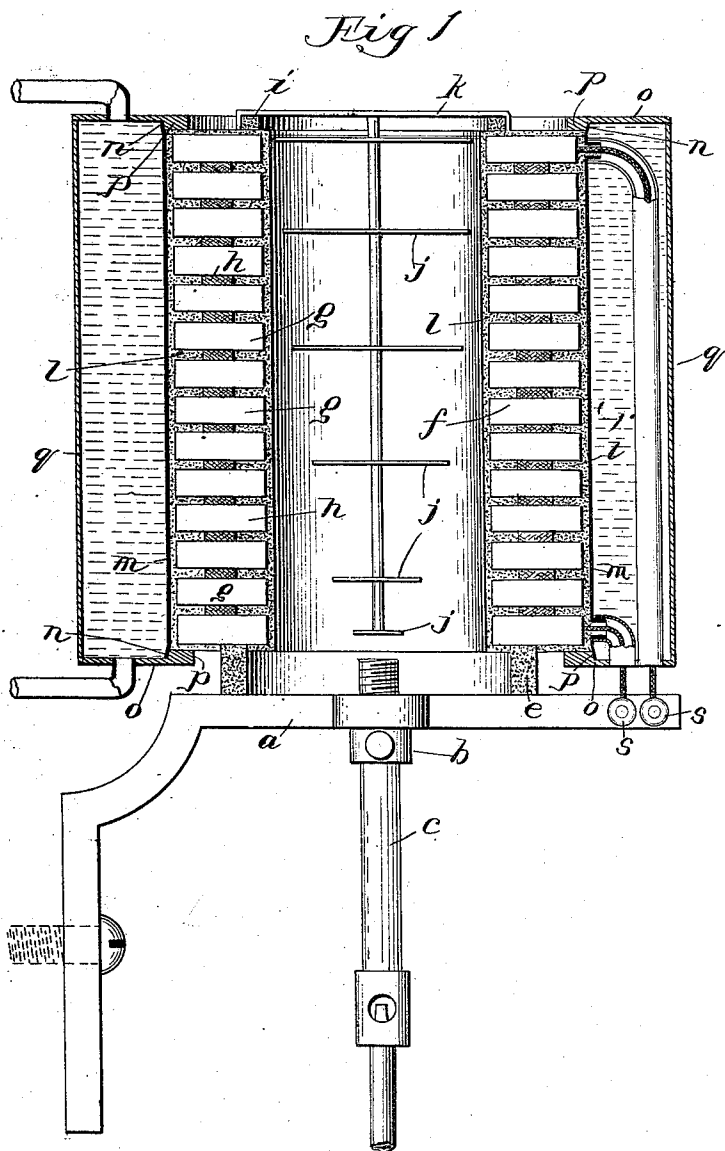
(No Model.)

2 Sheets—Sheet 1.

H. B. COX.
THERMO-ELECTRIC GENERATOR.

No. 535,489.

Patented Mar. 12, 1895.



WITNESSES:

C. M. Werle
Hubert & Peck

INVENTOR

Harry B. Cox
BY *J. E. Duffy*
ATTORNEY.

(No Model.)

2 Sheets—Sheet 2.

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Fig 2

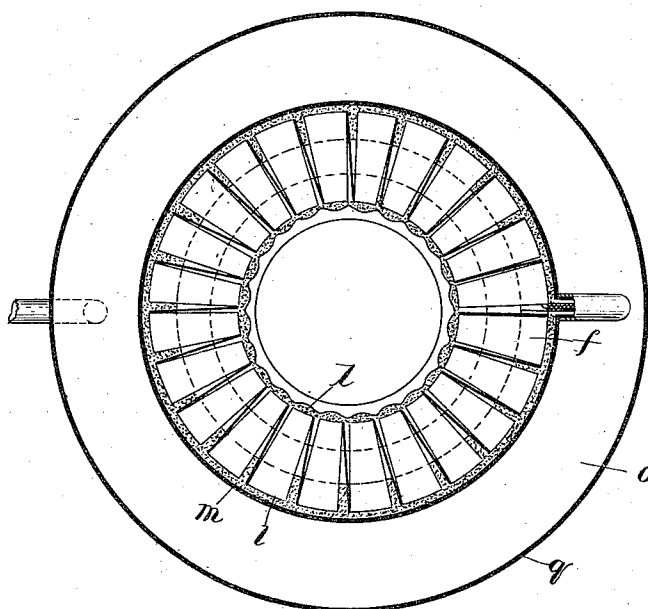
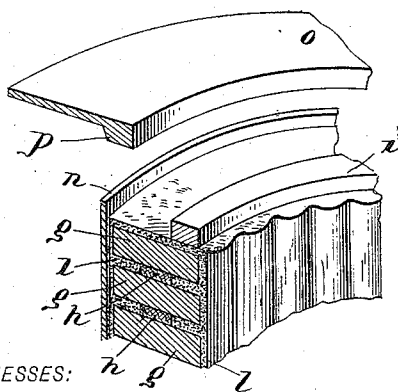


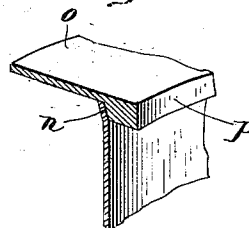
Fig 3



WITNESSES:

Chas. B. Burdine
Hubert C. Cook

Fig 4



INVENTOR

H. B. Cox
BY *[Signature]*
ATTORNEY.

UNITED STATES PATENT OFFICE.

HARRY BARRINGER COX, OF HARTFORD, CONNECTICUT.

THERMO-ELECTRIC GENERATOR.

SPECIFICATION forming part of Letters Patent No. 535,489, dated March 12, 1895.

Application filed March 8, 1893. Renewed August 14, 1894. Serial No. 520,329. (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 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 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 improvements in the manufacture and construction of thermo electric generators.

The object of the invention is to improve the construction of thermo electric generators so as to produce the same on a practical basis and exceedingly strong and durable against extremes of heat and yet cheap in construction and effective in action to generate a maximum current with a minimum consumption of fuel.

A further object of the invention is to provide improvements in the manufacture of thermo electric generators whereby generators of great strength and durability can be made quickly, easily and economically.

A further object of the invention is to improve certain details of construction and arrangements of parts and attachments whereby a complete and practical thermo electric generator is produced.

The invention consists in certain novel features of construction and in combinations of parts, and improvements in the manufacture of thermo electric generators, more fully and particularly pointed out hereinafter.

Referring to the accompanying drawings, Figure 1 is a vertical section of a thermo electric generator constructed according to my invention. Fig. 2 is a horizontal section. Fig. 3 is a detail enlarged section of a section of the pile showing the internal and external coating and the jacket around the outside coating. Fig. 4 is a detail sectional view showing the manner of attaching the head pieces.

In the drawings the reference letter *a*, in-

dicates a suitable support as a bracket usually having a vertical arm adapted to be secured to a wall or upright support where the bracket is to be thus secured. The bracket has a horizontal portion or spider frame provided with the central opening or tube *b*, through which any suitable burner *c*, such as a Bunsen burner can be passed and in which it can be secured in the desired vertical adjustment by any suitable means, such as a screw *d*. A suitable insulating ring or cylinder *e*, rests on the horizontal portion of the bracket or support. This cylinder is preferably so constructed as to be capable of considerable sustaining power and strength to support the thermo electric pile *f*, which rests thereon, although if desired the pile can be suitably supported in any other way so that this insulating cylinder will not have to sustain the same. The pile is preferably cylindrical in form, or of some suitable shape so that the heat can be suitably applied to the interior or one surface thereof. This pile is so arranged that the burner or other heating source will be centrally located beneath the open center thereof. The pile is suitably constructed of a series of rings *g*, placed one above the other with suitable interposed rings *h*, of insulating material between the rings. Each ring is composed of thermo couples and the rings are suitably connected electrically so that the pile has the positive and negative connections from opposite ends thereof. This pile is provided with the insulating ring or cylinder *i*, on the upper end thereof.

The series of deflectors *j*, are suspended centrally in the open center of the pile directly over the source of heat by means of a rod or other means depending from a suitable bracket or spider frame *k*, resting on the upper end of the pile.

The insulating cylinders prevent escape or radiation of heat but confine it within the pile until it reaches the upper end thereof.

In constructing the pile after the rings of couples have been properly placed together the entire pile inside and outside is coated with some suitable cement *l*, or other heat resisting refractory non conducting material,

such as fire clay, while soft. When the pile has thus been properly coated it is baked by subjecting it to a high temperature for a sufficient period to harden and vitrify the soft coating. The cylinder thus formed is of great durability and hardness and heat resisting qualities. The leading out wires or take offs from the ends of this pile project through the coating. This cylinder is then provided with a tightly fitting jacket *m*, preferably as herein-after described. A sheet of metal is provided slightly greater in length than the circumference of the pile cylinder and also greater in width than the length of the pile cylinder. This plate has two holes formed in it near one edge and the plate is placed on a flat surface and covered with some suitable cement which will unite the plate to the hard cement. The pile is then placed on the plate with the two take off wires from the ends of the pile projecting through the holes in the plate. The plate is then tightly rolled around the pile so that the ends thereof overlap, the inner surfaces of the plate being kept constantly coated with the plastic cement as the plate is rolled around the cylinder. After drying the ends of the plate are then suitably secured together by brazing, soldering or the like. This mode of building the pile results in a most solid, rigid and durable structure.

The edges of the metal jacket project beyond the upper and lower ends of the pile, as shown by *n*. The end heads or rings *o o*, are then placed in position. Each head has an annular projecting flange or rim *p*, around its central opening and having its outer edge beveled or inclined as shown. Hence when either head is placed on the pile the outer inclined edge of said projection engages the inner surface of the protruding edge of the metal jacket and when the head is forced home this edge forms a tight joint with the protruding edge of the jacket. The tightness of the joints thus formed between the heads and protruding edges of the metal jackets is further strengthened by brazing or soldering. The outer casing *q*, is then suitably secured to the outer edges of the heads, thereby forming the water jacket *r*, which has suitable inlet and outlet connections.

The take off wires from the opposite ends of the pile are carried out through the water jacket and through the heads to separate binding posts *s*, from which the current can be conveyed where desired. The conductors are suitably insulated from the water in the water space and from the metal heads and metal jacket.

While I have shown the generator as heated by a gas burner, yet it is obvious that the invention is not limited to such, but any desired suitable heating means or medium can be employed.

Various constructions and features have been specifically described herein for the

sake of clearness but I wish it understood that I do not limit myself to the construction herein set forth but consider myself entitled to all such changes and variations as fall within the spirit and scope of my invention.

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

1. The herein described mode of constructing thermo electric generators which consists in forming a cylindrical or hollow thermo pile, coating said pile with plastic refractory material, and intimately securing a metallic jacket around said refractory material, as and for the purposes set forth.

2. The herein described mode of making thermo electric generators which consists in forming a thermo electric pile, then coating the pile with refractory material, and hardening the same, and then wrapping the pile with sheet metal, and cementing or otherwise securing the same on the pile, substantially as described.

3. The herein described cylindrical thermo electric pile having an exterior coating of refractory material surrounded by a sheet metal jacket rigidly cemented thereto, as and for the purposes set forth.

4. The thermo electric pile having a metallic jacket cemented or otherwise intimately secured around the same, substantially as described.

5. The thermo electric pile coated with refractory material and having an exterior sheet metal jacket, substantially as described.

6. The thermo electric generator having its thermo pile coated with refractory material and having a sheet metal jacket, and a water jacket around the sheet metal jacket, substantially as described.

7. The thermo electric pile having the sheet metal jacket projecting beyond the ends of the pile, substantially as described.

8. The thermo electric pile having the exterior sheet metal jacket projecting beyond the ends of the pile, the heads having the rims fitting in said projecting edges of the jacket, and a casing surrounding said heads to form the water jacket, substantially as described.

9. In a thermo electric generator, the combination of the pile having the metal jacket projecting beyond the ends thereof, the heads having the rims having beveled edges fitted inside of the said projecting portion of said jacket, to form a tight joint, and the casing surrounding said head to form a water jacket around the pile, substantially as described.

10. A cylindrical thermo electric pile, in combination with a bracket supporting the same, and a gas burner carried by the bracket at the open center of the pile, substantially as described.

11. The combination with a thermo electric pile, of a bracket supporting said pile, a burner supported by the bracket at the open

center of the pile, and conductors from the pile to binding posts in the bracket, substantially as described.

12. In combination, a support, a thermo electric pile, a ring or cylinder of non conducting material between the support and pile, to prevent radiation or escape of heat, substantially as described.

13. The open or cylindrical thermo electric pile having the annular heads on and project-

ing laterally from the ends thereof, and the casing around the heads to form the water space, substantially as described.

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

HARRY BARRINGER COX.

Witnesses:

E. HENRY HYDE, Jr.,

J. L. FENN.