

(No Model.)

2 Sheets—Sheet 1.

M. L. SEVERY.

APPARATUS FOR UTILIZING STEAM FOR HEATING THERMOPILES.

No. 527,378.

Patented Oct. 9, 1894.

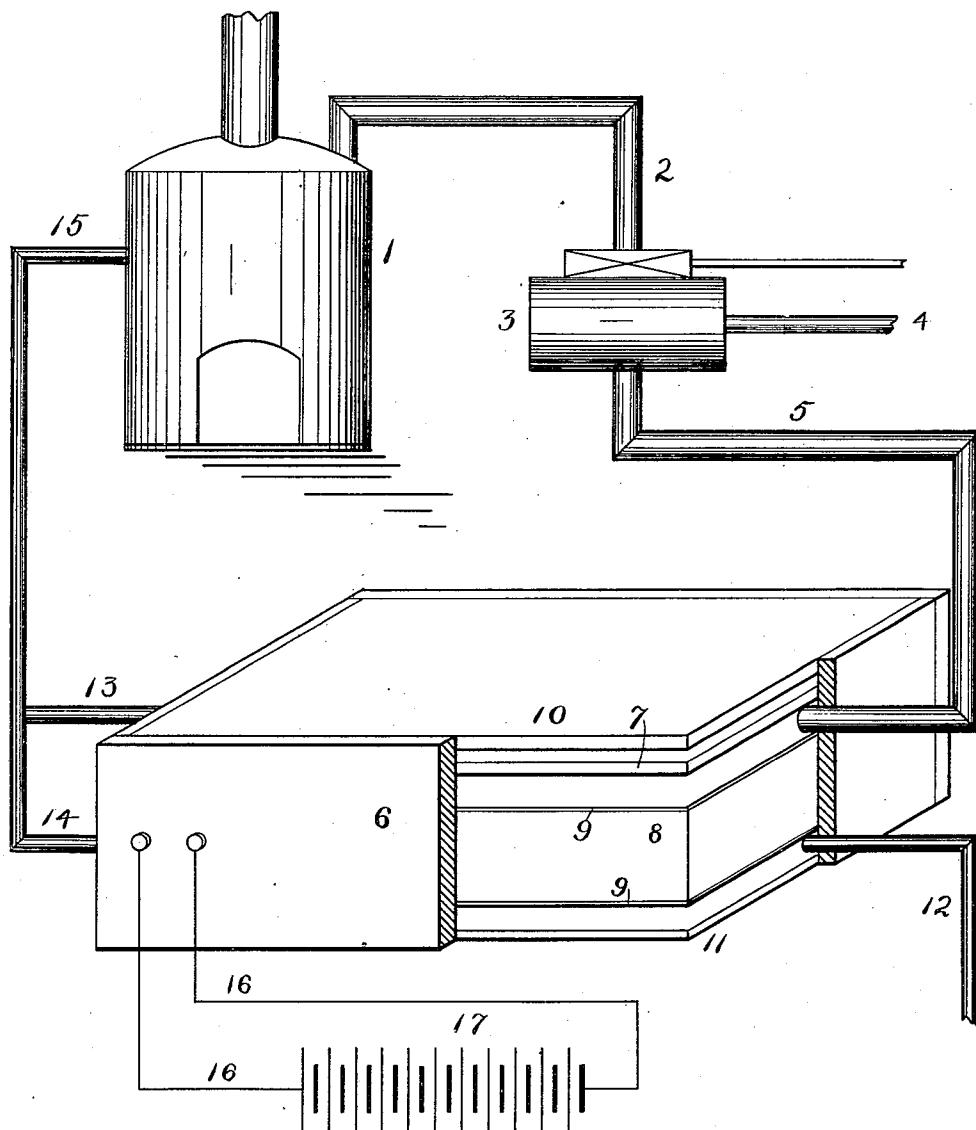


Fig. 1.

Witnesses.

Arthur C. Mudge.

J. H. Robinson

Inventor.

Melvin L. Severy.

by Howard Kellogg  
Atty.

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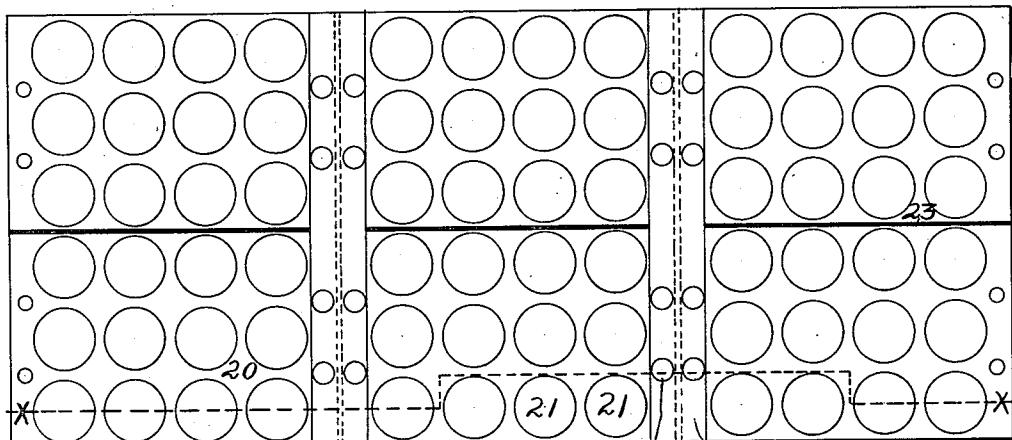


Fig. 2 24 25

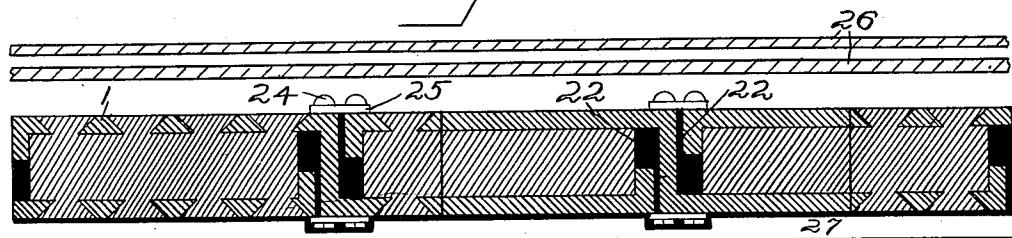


Fig. 3

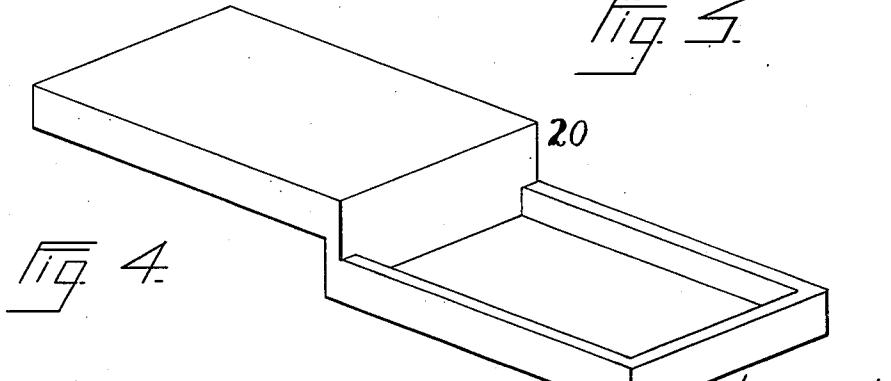


Fig. 4

Witnesses.

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# UNITED STATES PATENT OFFICE.

MELVIN L. SEVERY, OF BOSTON, ASSIGNOR OF ONE-HALF TO FRANCIS DOANE,  
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## APPARATUS FOR UTILIZING STEAM FOR HEATING THERMOPILES.

SPECIFICATION forming part of Letters Patent No. 527,378, dated October 9, 1894.

Application filed February 16, 1894. Serial No. 500,386. (No model.)

*To all whom it may concern:*

Be it known that I, MELVIN L. SEVERY, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Apparatuses for Utilizing Steam for Heating Thermopiles, of which the following, taken in connection with the accompanying drawings, is a specification.

10 The object of this invention is the utilization of the heat of the exhaust steam of an engine for the production of electricity and to heat the feed water for the boiler and to this end the invention consists mainly in the combination, substantially as hereinafter more fully set forth, with a steam boiler and engine, of a thermo-pile, one face of which is heated by the exhaust steam and the other face cooled by the feed water supply.

15 20 In the accompanying drawings, Figure 1 is a diagrammatic view of the boiler, engine and thermo-pile, and the pipes connecting the same. Fig. 2 is a plan view of a thermo-pile. Fig. 3 is a sectional view of the same on the line X, X, Fig. 2. Fig. 4 is an isometric outline of one of the elements of said pile.

In the several figures like numerals refer to like parts.

Referring to the drawings, 1 is a boiler; 2, 30 the pipe supplying steam to the engine. 3 is the steam cylinder of said engine.

4 is the piston rod, and 5 the pipe conveying the exhaust steam to the thermo-pile.

8 is the thermo-pile, which may be of any desired form, but is preferably of the form shown in Figs. 2, 3 and 4, and which I have described and claimed in another application filed herewith. The two faces of the pile may be covered with plates —9, 9— of some material impervious to moisture. Over the hot pole is a double jacket composed of plates —7, 10— separated by an air space, the object of which is to prevent loss of heat by radiation. Between the plate 7 and the face of the pile is a space through which passes the exhaust steam.

The steam heats the face of the pile, and in so doing will become condensed, and a pipe —13— connected to the feed water pipe —15— leading to the boiler is provided by which this condensed steam is conveyed back to the boiler.

Under the cool face of the pile is a plate —11— forming the bottom of the case —6— which incloses the pile, and this plate is separated from the bottom of the pile so that a space is formed through which passes the feed water from the pipe 12, and from which the feedwater, after cooling the back of the pile, is conveyed by the pipes 14 and 15 back to the boiler. In passing the feed water through the pile a double effect is obtained, as it not only cools the pile, but, by absorbing the heat from the pile the water becomes somewhat heated and better suited for injection into the boiler.

The current generated by the pile may be utilized for any purpose, as for example, charging a storage battery —17— which is connected to the pile by the wires 16.

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

1. The combination of a thermo-pile, a case containing the same having chambers or spaces extending across the opposite poles of the pile, a steam boiler, a feed water pipe 12 connected with one of the chambers, a pipe 14 also connected with said chamber and with the boiler, a steam engine, and a pipe 5 connected with the exhaust port of the engine and with the other chamber, whereby the exhaust steam may be utilized to generate a current of electricity in said pile and at the same time heat the feed water for the boiler, substantially as shown and described.

2. The combination, substantially as set forth, of a thermo-pile; a case containing the same; a water proof and heat conducting sheathing on the faces of said pile; spaces between the faces of said pile and the case; a pipe for conveying exhaust steam to one of these spaces; a pipe affording an outlet from said space; a pipe for conveying water or other cooling agent to the other space, and a pipe for discharging said cooling agent.

In testimony whereof I have hereunto subscribed my name this 9th day of February, A. D. 1894.

MELVIN L. SEVERY.

Witnesses:

CHAS. A. KELLOGG,  
ARTHUR C. MUDGE.