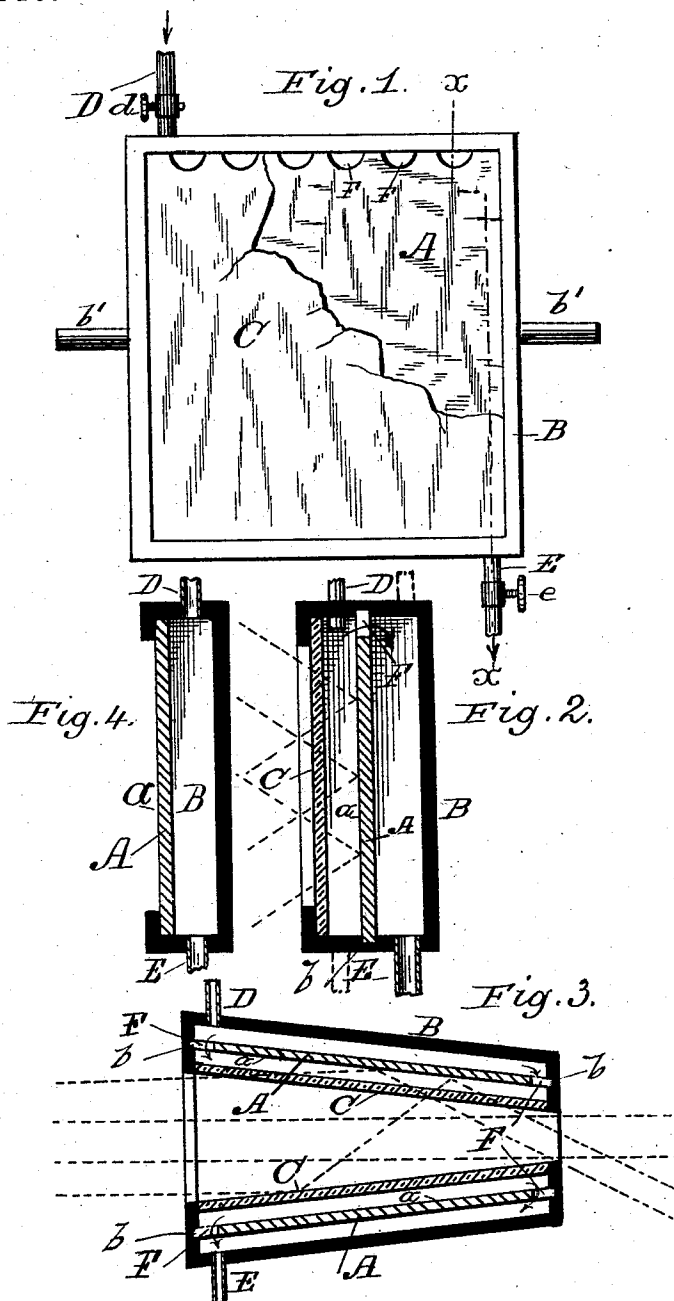


(No Model.)

W. CALVER.
SOLAR REFLECTOR.

No. 291,146.

Patented Jan. 1, 1884.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM CALVER, OF WASHINGTON, DISTRICT OF COLUMBIA.

SOLAR REFLECTOR.

SPECIFICATION forming part of Letters Patent No. 251,146, dated January 1, 1884.

Application filed April 25, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM CALVER, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Solar Reflectors, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 represents a reflector constructed in accordance with my invention. Fig. 2 is a vertical section on the line *x* of Fig. 1. Fig. 3 illustrates the application of my invention to a solar condenser, and Fig. 4 is a modification.

Like letters refer to like parts in all the figures.

In the art of utilizing the heat-rays of the sun, in accordance with the method and means for which a patent was granted me July 4, 1882, exceedingly high degrees of heat are produced, and I have found that even metal reflecting-surfaces are liable to become injured so that they are entirely unfitted for the performance of their function as reflectors.

The object of this invention is, primarily, to devise a reflector which is capable of withstanding excessive heat without affecting its power as a reflector; and with this object in view I have devised means whereby the reflector may be constantly enveloped by or in water, or any other liquid or gaseous refrigerative substance, either at rest or in motion.

I do not herein claim, broadly, the application to a reflecting-surface of a refrigerant, as that feature of this invention forms the subject-matter of a separate application (No. 92,864) filed herewith. In this case I employ a double jacket provided with means for maintaining a body of water or other suitable substance about and in contact with a reflector, and in a state of rest, or as a current, according to requirement or desire, by which means the reflector is prevented from absorbing sufficient heat to injure the reflecting-surface thereof.

Referring to the drawings, A represents the reflector, and *a* its reflecting-surface. The material of the reflector may be anything suited to its purpose, as also may the material of its accessories herein shown.

B represents the frame or case in which the reflector is secured, either by resting in grooves *b*, formed in the walls thereof, or in any other suitable manner. The case B is formed so as

to hold water or other liquid or gas, and is provided with a transparent face, C, and an opaque back, B, and an inlet, D, is arranged at one side of the reflector, an outlet, E, at the opposite side, and apertures or passages F through the substance of the reflector, so that the water or other refrigerative substance may be received into the case and pass about and envelop the reflector. Suitable controlling-valves, *d e*, are provided to regulate the supply and current, or retain a body of the water, gas, or air employed as a refrigerant, and trunnions *b' b'* are provided to adapt the reflector to be tilted or adjusted in or upon any suitable frame-work or support. For this latter purpose vertical pivots or trunnions may be located at the top and bottom of the reflector. The reflector may be plane, or concave, or convex, or of any other desired conformation in cross-section, and its case may or may not conform thereto as desired.

The operation is apparent. The rays of the sun, falling on the reflector, pass through the body or current of refrigerative substance, and are directed or returned by the reflecting-surface *a* to any desired locality, and the heat thereof, which would tend to injure the reflector, is absorbed by the refrigerant or reflected back, in part at least, so that an actual saving of heat is accomplished, especially when air is used in front and water at the back of the reflector.

The condenser illustrated in Fig. 3 forms the subject-matter of a separate application (No. 92,863) filed herewith; but, so far as the protection of its reflecting-surface is concerned, its operation is exactly like that of the plane reflector shown in Figs. 1 and 2. The dotted lines indicate the direction and course or path of the solar rays.

I am aware that lenses have been constructed so as to receive and retain liquids, and I do not claim such as of my invention.

It is apparent that a separate inlet and outlet may be provided for each side of the reflector, as shown in dotted lines, Fig. 2, to supply, retain, and deliver liquid, or one or more refrigerative substances, independently, on each side of the reflector, in which case the passages F would be omitted. Such a construction I deem the equivalent of that shown, so far as the protection of both the face and

back of the reflector is concerned. Furthermore, the front, or chamber, or jacket formed by the face C and the reflector A and case B may be omitted, as shown in Fig. 4, in which construction the inlet D would be located to deliver the refrigerant back of the reflector, which would therefore be water-jacketed or protected at the back only, and for many purposes such single water-jacket would be sufficient protection. I therefore do not limit myself to a double jacket or case.

I do not herein claim means for directing a refrigerative substance against a reflector, as that is embraced in a companion application (Serial No. 92,864) pending herewith.

Having described my invention and its operation, what I claim as new is—

1. A solar reflector provided with means, substantially as specified, for maintaining a confined current of refrigerative substance in

contact therewith, substantially as and for the purpose set forth.

2. The combination of a reflector having apertures therein with a water and air tight inclosing-case having a transparent face and an inlet and outlet, substantially as specified.

3. The combination of the reflector A, frame B, transparent face C, inlet D *d*, and outlet E *e*, substantially as shown and described.

4. The combination of the frame B, grooved as at *b*, and provided with trunnions *b'*, and inlet D and outlet E, with the reflector A, provided with apertures F, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM CALVER.

Witnesses:

E. B. STOCKING.

M. P. CALLAN.