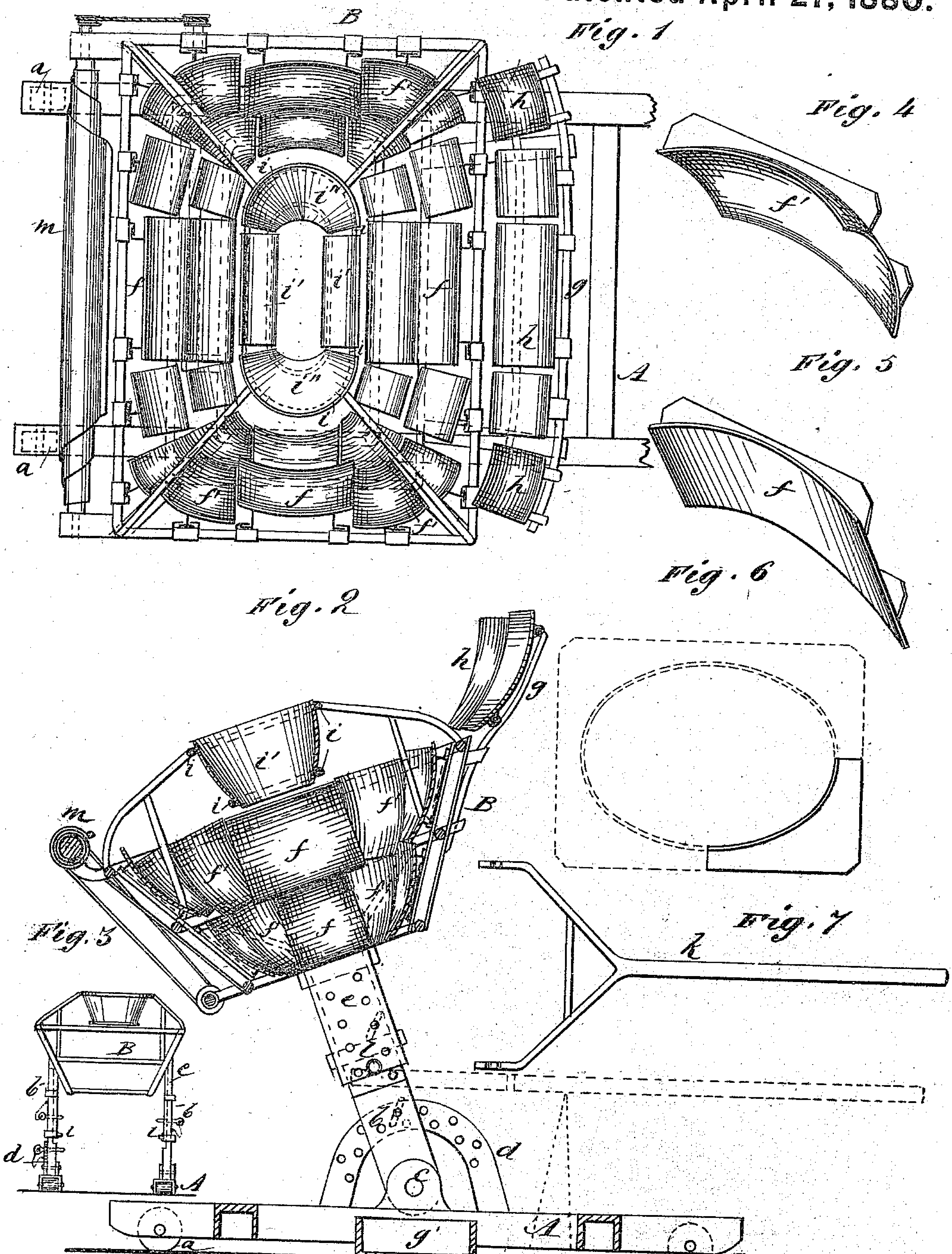
J. P. MAUZEY.
Solar-Heater.

No. 227,028.

Patented April 27, 1880.



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UNITED STATES PATENT OFFICE.

JAMES P. MAUZEY, OF BLACKFOOT, MONTANA TERRITORY.

SOLAR HEATER.

SPECIFICATION forming part of Letters Patent No. 227,028, dated April 27, 1880.

Application filed August 9, 1879.

To all whom it may concern:

Be it known that I, JAMES PRESTON MAUZEY, of Blackfoot, in the county of Deer Lodge and Territory of Montana, have invented a new and Improved Solar Heater, of which the following is a specification.

My improvement relates to apparatus for concentrating and focusing the rays of the sun to utilize the heat.

Figure 1 is a plan view of my improved solar heater. Fig. 2 is a vertical section of the same. Fig. 3 is an end view in smaller size. Figs. 4, 5, and 6 represent reflectors in different forms. Fig. 7 represents a bar made use of to elevate and sustain the swinging frame.

Similar letters of reference indicate corresponding parts.

A is the supporting-base, consisting of a rectangular wood or metal frame mounted on wheels or rollers *a*. B is the reflector-carrying frame, sustained upon the base A by the side arms, *b*, that are pivoted at *c*. Upon each side of A is attached a semicircular brace, *d*, perforated with numerous holes corresponding to holes in the arms *b*, so that by the insertion of a pin the arms *b* and frame B are sustained at the desired inclination. The arms *b* and frame B are united by means of sockets *e*, that are attached to B and set over *b*, and are retained in place by pins passing through holes, so that the frame B can be raised and lowered.

The frame B is of oblong shape, square or rounded at the angles, and with the sides and ends inclining outward from the bottom to the upper edge, as shown in Fig. 3, and is fitted at the inside with the reflectors *f f'*, by which the sun's rays are concentrated and thrown to a focus upon the object to be heated, which is represented by a receptacle, *g'*, on the ground at the center of frame A. The frame B is constructed of metal or wooden rods, to which the reflectors are detachably connected, so that they can be removed or adjusted.

The reflectors are made in two shapes—one shape (shown in Fig. 4 at *f'*) being concave, and the other, Fig. 5, curved or concave in one direction only. The last-named shape may be considered as a section of an elliptical cylinder, as represented in Fig. 6, and the reflector may be a full quadrant of the ellipse or any portion of the same, the concavity being regulated by the distance the reflectors are placed from the object to be heated and their relative position therewith, and in some cases it may be desirable to vary the concavity in each reflector, the rule in all cases being that the concavity should decrease in proportion to the distance from the object, and the concavity in all cases should be a quadrant or part of a quadrant of an ellipse. By this shape and construction the reflectors will focus the rays on a straight line. The reflector shown in Fig. 4, at *f'*, will convey the rays to a point. Its concavity lengthwise is in the arc of a circle, and crosswise in the arc of an ellipse. This form is intended for the ends and corners of frame B, the others being for the sides.

For increasing the extent of the side reflecting-surface the frame B is fitted with sockets for sustaining the rods of an auxiliary frame, *g*, carrying reflectors *h*.

At the center of the frame B are sustained, by rods passing to the corners of the main frame, one or more smaller reflector-frames, *i*, that are fitted with their straight side reflectors, *i'*, and curved end reflectors, *i''*, hung to focus upon the object to be heated.

In use the swinging frame B must always be directed to the sun, and by the above-described construction this may be accomplished with great facility. Supposing the apparatus standing with the end of frame A north and south, the arms *b* vertical, and the sun at the meridian, the focus of the rays should then be upon the object; but as the sun moves west the focus would shift to the side of the object, and it would be necessary to swing the frame B on the axis *c* to retain the focus at the proper place, and the frame is to be thus moved at intervals and held in place by the devices before described, and the whole apparatus may be moved on the supporting-rollers for perfectly accurate adjustment.

From the different positions that the reflectors will be placed in by the east and west adjustment the position of the focus is liable to be changed either short of or beyond the object to be heated. This defect may be readily remedied by raising and lowering the frame B on its supporting-arms *b*, and to assist this operation I provide a forked bar, *k*, (see Fig. 7,) which is to be used as a lever by application of its forked ends to the pins l on sockets e, and a suitable fulcrum, as illustrated by dotted lines in Fig. 2.

The mechanism for raising, lowering, and sustaining the frame B may be of any suitable character. The construction shown is adapted for light apparatus; but with large heaters, requiring considerable power for their manipulation, other mechanism — such as cogged gearing and cranks—may be used.

The reflectors are to be made of glass or sheet metal, and in one or more pieces, as most convenient. The apparatus is also fitted with curtains m, of non-transparent material, hung on rollers at one or more sides of the frame B. These curtains are intended for being drawn over the top of the reflectors to shut off the rays of the sun when desired.

The above-described solar heater is a convenient and effective means for utilizing the heat of the sun for any desired purpose. The rays of the sun are gathered from an extensive area and concentrated in a most effective manner upon the desired object, and the adjustment can be made with facility.

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

1. In a solar heater, the pivoted arms b and sockets e, in combination with the base A and reflector-frame B, substantially as and for the purpose specified.

2. In a solar heater, the adjustable reflector-holding frame B, formed with sides having corners, and fitted with the adjustable reflectors, substantially as and for the purposes set forth.

3. In combination with the adjustable reflector-holding frame B, the auxiliary frame g and reflectors h, substantially as and for the purposes specified.

4. In combination with the reflector-holding frame B, the central reflector-frame, i, having straight side reflectors, i', and the curved end reflectors, i'', attached to frame B, substantially as and for the purposes set forth.

5. In a solar heater, the rolling curtains m, in combination with the reflectors on frames B i, substantially as and for the purposes described.

JAMES PRESTON MAUZEY.

Witnesses:
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