

(No Model.)

2 Sheets—Sheet 1.

H. A. W. BRAUNE.
SELF ACTING SOLAR REFLECTOR.

No. 326,711.

Patented Sept. 22, 1885.

Fig. 2

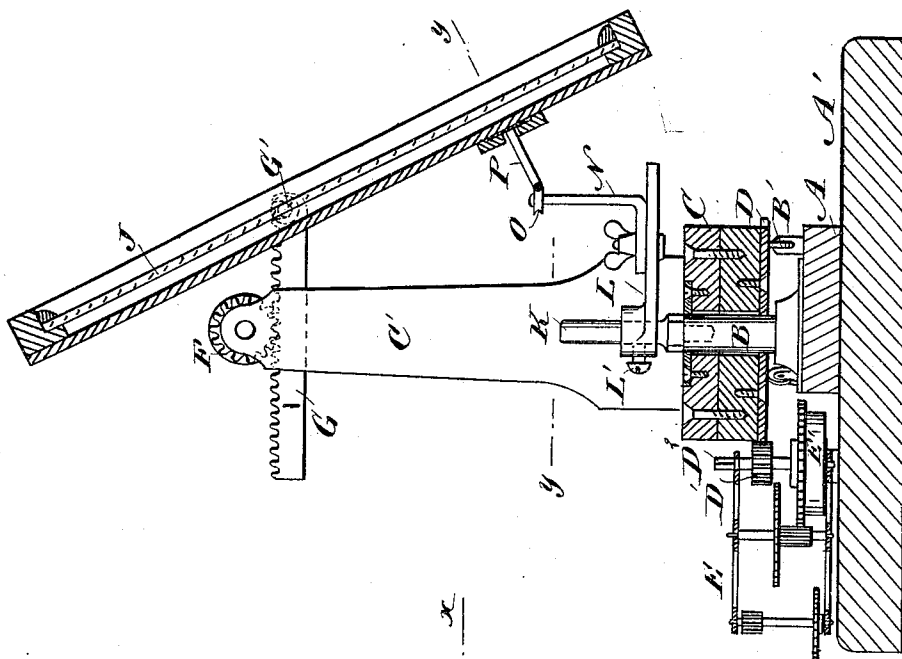
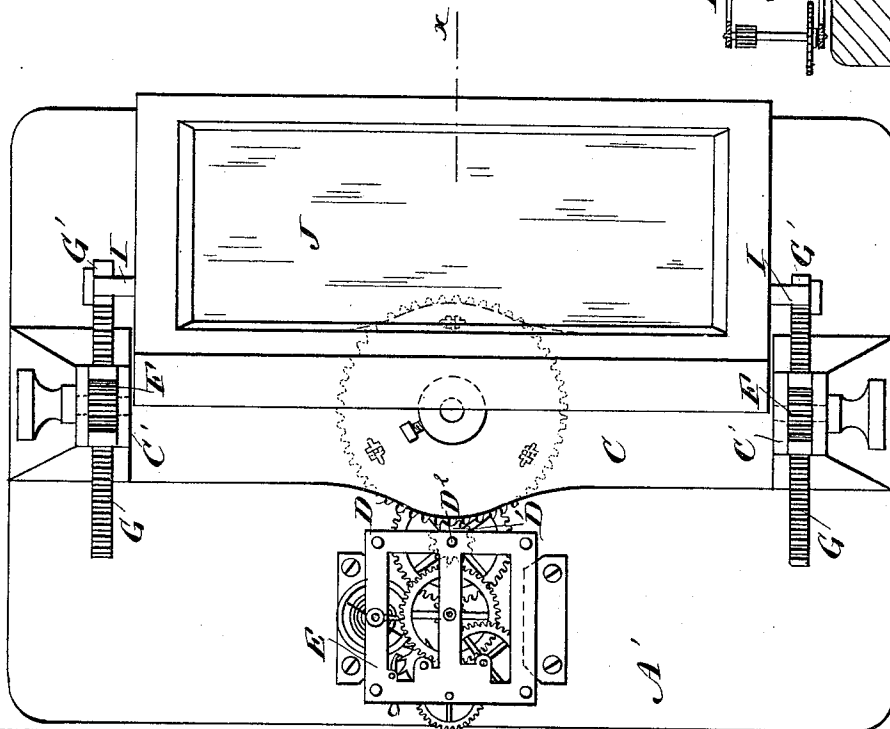


Fig. 1



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G. Sedgwick

INVENTOR:

H. A. W. Braune
BY *Munn & Co.*
ATTORNEYS.

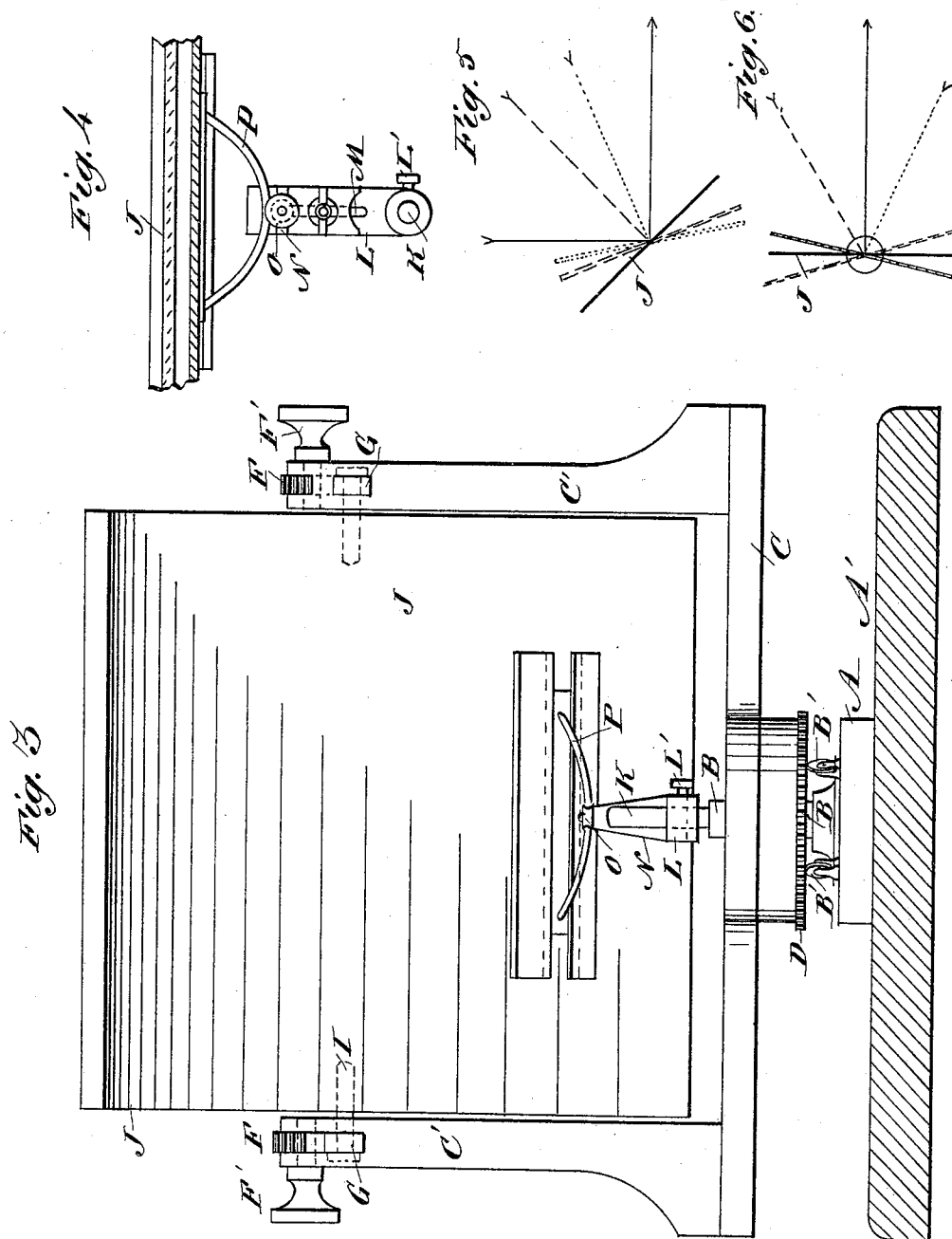
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C. Neveu
C. Sedgwick

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UNITED STATES PATENT OFFICE.

HEINRICH A. W. BRAUNE, OF VALPARAISO, INDIANA.

SELF-ACTING SOLAR REFLECTOR.

SPECIFICATION forming part of Letters Patent No. 326,711, dated September 22, 1885.

Application filed January 30, 1885. (No model.)

To all whom it may concern:

Be it known that I, HEINRICH A. W. BRAUNE, of Valparaiso, in the county of Porter and State of Indiana, have invented a new and Improved Self-Acting Solar Reflector, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved self-acting solar reflector which is turned by clock-work and keeps a beam of light continually in the same position in relation to the lens of the solar camera.

The invention consists in a guide and a fixed piece for changing the inclination of the mirror as it revolves, and of devices for adjusting the inclination of the longitudinal horizontal axis of the mirror to the longitudinal horizontal axis of the revolving frame.

The invention also consists in parts and details and combinations of the same, as will be fully described and set forth hereinafter.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of my improved solar reflector. Fig. 2 is a cross-sectional elevation of the same on the line *x x*, Fig. 1. Fig. 3 is a rear view of the same. Fig. 4 is a sectional plan view on the line *y y*, Fig. 2. Fig. 5 is a sectional upright diagram showing the reflection. Fig. 6 is a sectional plan diagram showing the reflection of the rays.

The circular plate A projects upward from a base-plate, A', and from the said circular plate a pivot, B, projects upward.

Around the lower part of the pivot a series of anti-friction rollers, B', are pivoted in jaws projecting upward from the circular plate A. A cross-piece, C, provided at each end with a standard, C', has a central aperture, through which the pivot B passes, and to the under side of the cross-piece C a cog-wheel, D, is secured, through which the pivot B passes centrally, the said cog-wheel running on the rollers B' on the circular plate A. The cog-wheel D engages with a pinion, D', on a shaft, D'', of the clock-work E, on which shaft D'' a spring, E', is secured. The pinion D' is an additional wheel, not provided on the usual clock-works. The number of teeth in the pinion D' and the cog-wheel D is so arranged that the cog-

wheel D with the cross-piece C is revolved as the earth revolves, or at the rate of every twenty-four hours. These wheels must be proportioned very carefully, so that the movements of the cross-piece C and the parts supported by the same are absolutely exact and true. The cross-piece C turns very freely, and but very little power is required to operate it.

In the upper end of each upright C' on the cross-piece C a pinion, F, is arranged, which is provided with a hand-wheel, F', for turning it, and engages with a rack, G, arranged to slide in the upper end of the standard at a right-angle to the longitudinal axis of the cross-piece C. Each rack G is provided with a hook, G', adapted to receive pivots I, projecting from the side edges of the mirror J, which mirror is thus hung on the racks G, and by means of the same is supported by the standards C'. By turning the pinions F the racks G can be shifted in the standards C' at right angles to the longitudinal axis of the revolving frame on the pivot B, and the pivots I of the mirror J can be adjusted a greater or less distance from the centers of the uprights. The axis uniting the pivots I can thus be adjusted to be parallel with the longitudinal axis of the revolving frame; or, by adjusting one rack G in such a manner that its hook is nearer the middle of the standard C' than the hook of the other rack is, the axis uniting the pivots can be adjusted to be at a greater or less inclination to the longitudinal axis of the revolving frame. This is necessary in order to permit of adjusting the mirror according to the position of the sun, which is more to the north in summer and more to the south in winter. The distance from the left-hand pivot of the mirror to the left-hand upright O' must be less than the distance from the right-hand pivot of the mirror to the right-hand pivot C', and in summer the right-hand pivot must be nearer the right-hand upright C' than the left-hand pivot is to the left-hand upright C'.

The adjustment by means of the rack is very simple; but I do not limit myself to the use of the same, but may use any other device for adjusting the bearings of the pivots of the mirror a greater or less distance from the uprights.

A standard or pin, K, projects upward from the pivot B, and on the same an arm, L, is

held by a set-screw, L', which arm is provided with a longitudinal slot, M. An angular upwardly-projecting piece, N, rests on the arm L, and is held on the same by a screw and winged nut passed through the slot M, thus permitting of adjusting the upwardly-projecting piece N a greater or less distance from the pin or standard K.

A grooved roller, O, is pivoted on the upper end of the upwardly-projecting piece N, and against the rim of the said roller a curved guide-piece, P, rests, which projects from the back of the lower part of the mirror. The arm L and the upwardly-projecting piece N are held firmly and do not revolve.

The operation is as follows: The clock-work revolves the revolving frame once in every twenty-four hours. In the morning, at sunrise, one end of the curved guide P rests against the roller O, and the mirror J is held vertically, or at only a slight inclination, so that the rays of light will be reflected directly upon the lens of the camera. As the revolving frame continues to revolve the guide P travels on the fixed piece or arm N, and thus gradually those parts of the guide near the middle of the same come in contact with the roller O, and thus the back of the mirror is gradually moved a greater distance from the roller O. As the guide P is on that part of the mirror below the pivots, the lower part of the mirror is gradually moved from the roller O—that is, the mirror is inclined. As the sun rises the inclination of the mirror must be increased, so that the reflected rays will always have the same direction, both horizontally and laterally, as the rays reflected in the morning had. When the sun begins to move downward, the inclination of the mirror must be decreased, which is also accomplished by the guide P, as in the afternoon that part of the guide P from the middle toward the end gradually runs along the roller until the sun sets, when the mirror is vertical again. During the night the guide is not in contact with the roller, but comes in contact with it again in the morning.

Fig. 5 shows the different inclinations of the mirror as produced by the guide P and the upright N', and Fig. 6 shows the different inclinations that will be produced by the revolving frame carrying the mirror.

The arm L and the upright N', carrying the roller O, can easily be adjusted as circumstances may require. The beam of reflected light has the same positions at all times, and is always thrown directly against the lens in the camera.

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

1. In a solar reflector, the combination, with a revolving frame having uprights, of a mirror or reflector having pivots, and supports for the pivots held on the uprights of the revolving frame, said supports being adapted to be adjusted a greater or less distance from the longitudinal central plane of the revolving frame, substantially as herein shown and described.

2. In a solar reflector, the combination, with a revolving frame having uprights, of a movable cross-piece held in each upright and provided with a hook, and a mirror or reflector having pivots resting in the hooks of the said movable pieces in the uprights, substantially as herein shown and described.

3. In a solar reflector, the combination, with a revolving frame having uprights, of racks in the uprights provided with hooks, pinions engaging with the racks, and a mirror having pivots resting in the hooks of the racks, substantially as herein shown and described.

4. In a solar reflector, the combination, with the base A' and the pivot B, of the rollers B', the cross-piece C, having uprights C', the clock-work E, the cog-wheel D, connected with the cross-piece C and operated from the clock-work, and a mirror pivoted in the uprights of the revolving frame, substantially as herein shown and described.

5. In a solar reflector, the combination, with a revolving frame having uprights, of a reflector pivoted in the uprights, and devices for adjusting the longitudinal horizontal axis of the mirror at an inclination to the longitudinal axis of the revolving frame, substantially as herein shown and described.

6. In a solar reflector, the combination, with a revolving frame, of a mirror or reflector pivoted in the said frame, a guide on the mirror, a fixed piece, and a roller or pulley pivoted in the fixed piece, against which pulley the guide on the mirror rests, substantially as herein shown and described.

7. In a solar reflector, the combination, with a pivot, B, of a revolving frame, of a mirror pivoted in the frame, the arm L, projecting from a pin or standard on the pivot B, the upright piece N, held adjustably on the arm L, the roller O, on the upper end of the piece N, and the curved guide on the back of the mirror, substantially as herein shown and described.

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Witnesses:

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