

(No Model.)

W. S. BARSTOW.

HELIOSTAT OR PORTE LUMIÈRE.

No. 292,198.

Patented Jan. 22, 1884.

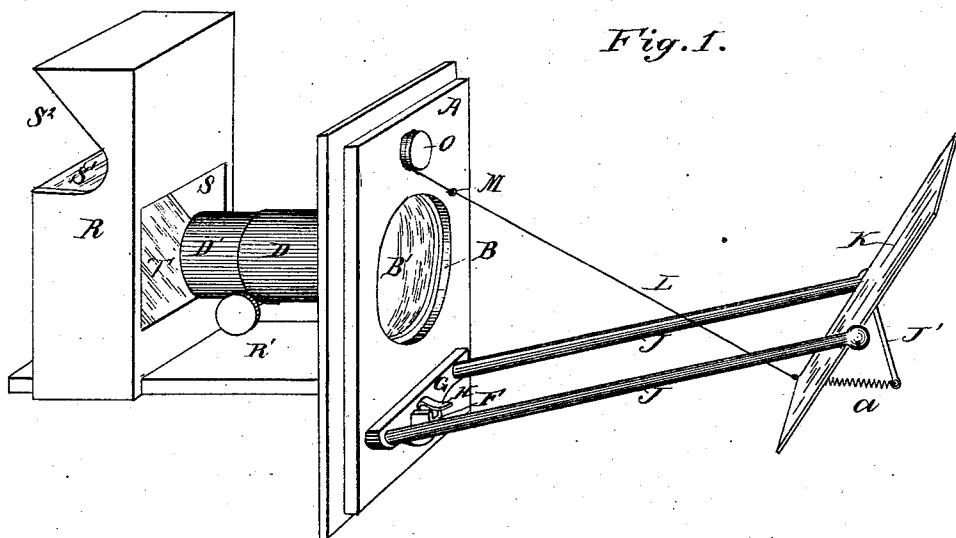


Fig. 1.

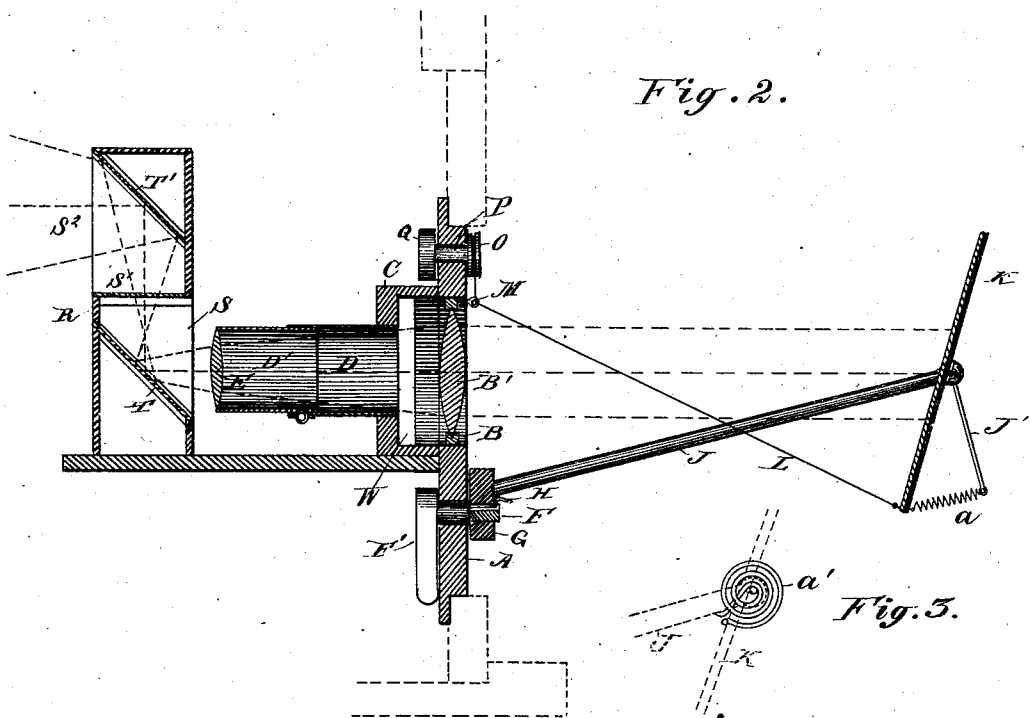


Fig. 2.

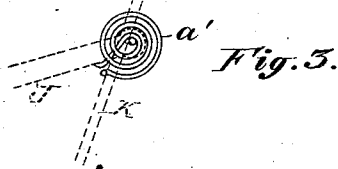


Fig. 3.

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HELIOSTAT OR PORTE LUMIÈRE.

SPECIFICATION forming part of Letters Patent No. 292,193, dated January 22, 1884.

Application filed October 31, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. BARSTOW, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Heliostats or "Porte Lumières" for Windows; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to a heliostat or porte lumière designed to reflect the sunlight from an outer adjustable mirror in through a suitable opening fitted with a tube and lens or lenses upon a screen or wall in an otherwise darkened room, for the purpose of illuminating and displaying, by means of the reflected or transmitted light, microscopic objects, photographic views, and specimens of all manner of things.

It has for its object the construction of a simple, portable, easily adjusted heliostat, at a cost which will place it within reach of the public generally, and in a form which will admit of its use with windows of any description.

In the accompanying drawings, Figure 1 is a view in perspective of my improved porte lumière adjusted for use; Fig. 2, a longitudinal central section through the same, its position in a window being indicated by the dotted lines; and Fig. 3 is a detached view of a portion of the mirror and its support, illustrating a modification in the form of the spring for actuating the mirror.

A represents a board or plate adapted to the support of the apparatus, and whose edges are preferably rabbeted, to permit it to be readily fitted vertically, either directly in the frame of a window between the sash raised for the purpose and the sill, (see dotted lines, Fig. 2,) or into a board or frame provided with an opening to receive it, and itself fitted to the window-opening. The board A is provided with a central opening, B, in which is fitted a double-convex lens, B', and over the inner side of said opening is secured, by detachable fastenings, a case, C, fitted with adjustable telescopic tubes D D', in the outer end of which is placed the second lens, E. A pin or shaft, F, is led through a central aper-

ture beneath the lens-opening B in the board A, so as to rotate therein, and is fitted upon its inner end with a crank arm or lever, F'. A transverse bar, G, is fitted centrally upon the outer end of the shaft F by means of a rectangular opening or socket in the middle of the bar, adapted to fit upon the squared end of the shaft, to which it is made fast by means of a catch-spring, H. In the ends of the bar G, which is thus fitted to oscillate upon the pin F against the outer face of the board, two parallel rods, J J, are fitted to project therefrom with a slight upward inclination, so that their outer ends shall be on a level with the center of the lens-opening B when the board A is secured in a vertical position. Between the outer ends of these rods J J is pivoted a suitable mirror, K. The lower end of the mirror is made to swing outward by means of a spiral spring, a, one end of which is attached thereto, the other end of the spring being made fast to the end of an arm, J', projecting downward from the supporting-rod J, the resiliency of the spring tending to draw outward the lower end of the mirror.

Fig. 3 illustrates a modification in the application of the spring to the mirror, consisting in the interposition upon the supporting-shaft, between the mirror and the rod J, of a helical spring, a', (see Fig. 3,) so that one arm of the spring shall engage with the rod J and its free end shall rest against the face of the mirror below its point of suspension and operate to swing the lower portion outward.

From the lower end of one edge of the mirror a cord, L, is led to a guide-ring, M, on the outer face of the board A, above the lens-opening B, and thence to a pulley, O, upon the end of a pin or shaft, P, extending through the board A, to be rotated by a hand wheel or crank, Q, upon its inner side. The end of the cord is secured to the periphery of the pulley O, so that the rotation of the pulley in one direction shall, by winding up the cord, draw in the lower end of the mirror, and thus cause its inclination. The mirror thus admits of adjustment in two directions: first, by rotation upon its axis at F, produced by turning the crank F'; and, second, by rotation upon its transverse pivotal axis between the rods J J, produced by turning the wheel or crank Q and

pulley O, and thereby winding up or unwinding the cord L. By thus properly adjusting the mirror, the rays of the sun falling thereon may be readily reflected directly upon and through the lens B into the tubes D D; and it will be observed that the operator is enabled to effect this adjustment readily from within the window without disturbing the board A, secured within the window-frame.

R represents an upright case, to be used in connection with the mirror and lenses, for the support of the objects which are to be illuminated by the solar rays. This case is mounted and supported upon a base-board, R', secured to the upright board A, to project inwardly therefrom at a right angle therewith, and is made adjustable thereon to and from the lens-tube. It is constructed with a lower forward opening, S, on one side, and with an upper rear opening, S', above its center on its opposite side. A mirror, T, is fixed within the case opposite the lower opening, S, at a suitable angle to reflect the rays of light falling thereon directly upward, and a second mirror, T', is fixed within the case opposite the upper opening, so that the rays of light diverted upward shall be reflected outward through the opening S', to fall upon a screen or wall in the room.

A plate of clear glass, S', upon which to place the objects to be illustrated, is interposed within the case between the mirrors T T', and the light made to pass through them will cause their image to be clearly displayed by reflection upon the screen. This device avoids the necessity of mounting the objects in slides. The second lens, E, may be fitted over the transparent plate S', between it and the mirror T', instead of in the end of the lens-tube D'. Where the objects are mounted in slides, these are inserted for exhibition in a slide-opening, W, formed in the case C, so that the rays of light entering from the lens B' may pass through the same.

The apparatus thus simply constructed and fitted together admits of being easily taken apart and packed in a small compass. By lifting the spring-catch H, the plate G, rods J J, and mirror K are readily removed from the board A. The case C and lenses D D are also readily detached and removed from the board, as also the arm or plate R' and the auxiliary case R.

I claim as my invention—

1. The combination, in a window-heliostat, with a vertical supporting-board provided with a lens-opening and suitable lens-tubes, of a detachable bar pivoted centrally against the board upon the outer end of a pivotal pin or shaft led through the board, to be operated from the inside, a spring-catch for securing the bar to the pivot-pin, parallel rods extending from each end of said bar, and a mirror pivoted between the ends of said rods, all substantially in the manner and for the purpose herein set forth.

2. The combination, in a window-heliostat, with a vertical supporting-board provided with a lens-opening and fitted with suitable lens-tubes secured thereon, of parallel rods adapted to revolve upon a common pivotal axis at a right angle to the board, a mirror pivoted between said arms, a spring actuating said mirror to force its lower end outward, and a cord leading from the lower end of the mirror to a pulley rotating in bearings in the board, to provide for the vertical adjustment of the mirror, substantially in the manner and for the purpose herein set forth.

3. The combination, with a board or frame, A, adapted for insertion in the window or other opening, and provided with an opening, B, to receive a lens and tube, and a mirror, K, supported outside of said board upon pivotal supports admitting of its adjustment both in line parallel with the board and about an axis at right angles thereto, a case, R, fitted upon a supporting-base projecting from the board on the side opposite the mirror, and provided with an opening in line with the lens-opening on the board, a mirror, T, fixed within the case opposite said opening at an angle therewith, a second mirror, T', fixed in the top of the case parallel with the first, to deflect the rays therefrom through an opening, S', in the front of the case, and a transparent plate, S', interposed between the mirrors, all substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WM. S. BARSTOW.

Witnesses:

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A. W. STEIGER.