No. 617,684. Patented Jan. 10, 1899.

J. P. FRIEZ.

HELIOGRAPH.

(Application filed May 17, 1898.)

(No Model.)

Fig. 1.

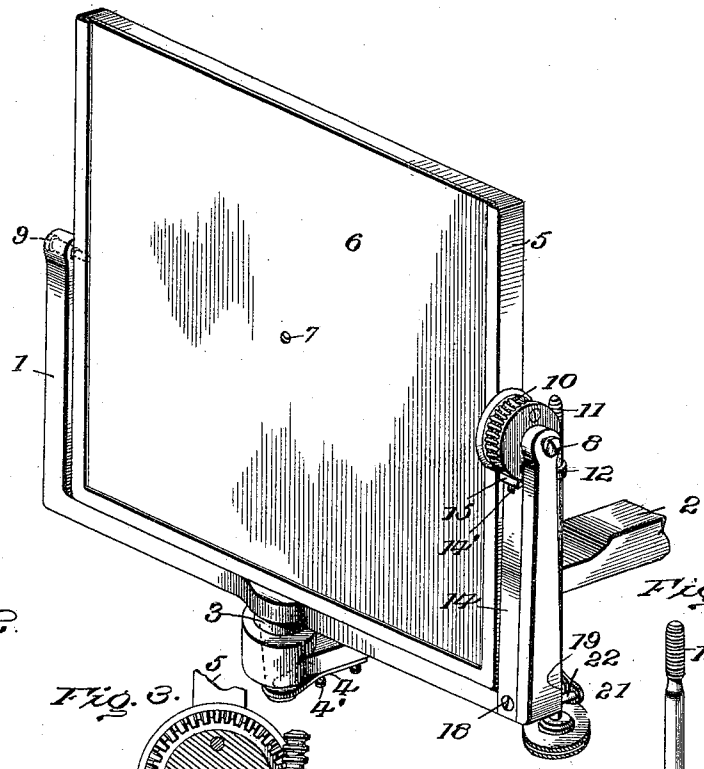


Fig. 2.

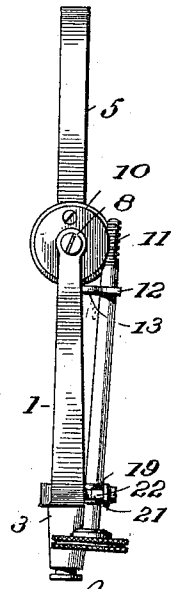


Fig. 3.

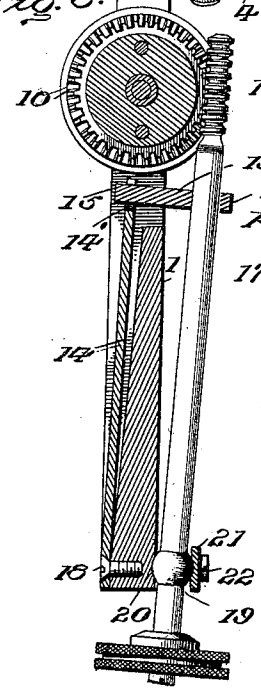


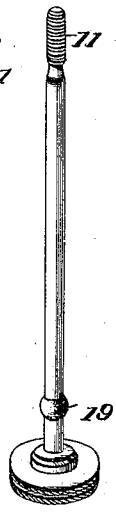
Fig. 4.



Fig. 5.



Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

JULIEN P. FRIEZ, OF BALTIMORE, MARYLAND.

HELIOGRAPH.

SPECIFICATION forming part of Letters Patent No. 617,684, dated January 10, 1899.

Application filed May 17, 1898. Serial No. 680,934. (No model.)

To all whom it may concern:

Be it known that I, JULIEN P. FRIEZ, a resident of Baltimore city, in the State of Maryland, have invented certain new and useful Improvements in Heliographs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

The invention relates to heliographs, and particularly to devices for supporting and adjusting the mirror or mirror-frame in its support; and it has for its object to increase the certainty, ease, and speed of operation of such devices.

The invention consists in the construction hereinafter described and pointed out.

In the accompanying drawings, Figure 1 is an isometric view of a mirror with the improved devices. Fig. 2 is an elevation of the improved adjusting mechanism and of an end of the mirror-frame. Fig. 3 is a transverse section of the adjusting devices on an enlarged scale. Fig. 4 is a perspective of a bar to connect a tangent-screw with a spring which holds the screw to its work. Fig. 5 is a similar view of the spring. Fig. 6 is a like view of the tangent-screw.

Numeral 1 denotes a mirror-support, and 2 a portion of the bar that carries the two mirrors customarily employed. The support has a post 3, by which it is seated in the bar, and 4 is a spring embracing the foot of the post and adapted to hold it in its bearing in the bar. 4′ is a tension-screw.

5 indicates a mirror-frame, and 6 the mirror, provided with a centrally-situated sight-hole 7. The frame is rotatably suspended between the uprights of its support by pivots 8 and 9.

The above-described parts may be of usual or of any desired form.

Fixed to the frame 5 and rotatable upon pivot 8 is a worm-gear 10, and 11 denotes a tangent-screw which meshes with the gear and turns it, together with the mirror-frame, about the pivots 8 and 9. The screw 11 has a bearing in a ring 12, formed at one end of a transverse bar or arm 13. The opposite end of said arm extends through an open slot in the upper end of a spring 14 and carries a cross-head 15, provided with a knife-edge 16, bearing in a seat 17, formed in the spring. In the instance shown the cross-head is inclosed within the spring-slot by the gear situated adjacent thereto. The arm 13 is movable lengthwise the screw and in the spring-slot 14′. The foot of the spring is secured to the support at 18. The screw has a milled head for its manipulation and is provided with a ball-bearing adjacent said head.

19 indicates the ball formed on the screw. It bears in a concavity 20, formed in the support 1, and also has a bearing in the under side of a plate 21. The plate 21 is held in suitable relation to the ball by the screws 22.

In operation the screw is turned either to the right or left, according to the desired adjustment of the mirror. This has the effect to rotate the gears 10 and the mirror-frame, to which said gear is fixed. In practice both the sun-mirror and the station-mirror will be equipped with the improved adjusting and holding devices. The spring holds the screw to its work in a yielding manner and provides for a sure, smooth, and easy action, and it also provides for a quick return of the mirror without manipulating the screw when it is desired either to fold the mirror preparatory to packing the instrument or to manipulating it quickly for use. Obviously the mirror can be approximately adjusted by direct manipulation of its frame and the adjustment nicely perfected by the screw. When quick action is desired for any reason, the mirror-frame can be turned on its pivots directly, and the spring will yield to permit the screw to slip on the gear. To facilitate this action, a truncated screw-thread substantially such as illustrated may be employed and is preferred.

In the operation the screw is forced from the gear-teeth and turned about the ball 19 by the quick turning of the frame and gear. The spring is also overcome and yields sufficiently to permit the gear to escape the thread.

Both ends of the bar 13 are loosely held—one upon the screw and the other in the spring—so that said bar readily adjusts itself to any change in the direction of the screw and situation of the spring. The edge of the cross-head 15 is, however, constantly held in its seat, and the arm-ring 12 finds a true bearing on the screw below its threaded portion.

By the construction described the screw is held to its work securely even after it has be-

come worn, and it is ready when occasion demands a quick folding or opening of the mirror-frame to permit the independent rotation of the gear. At such time it moves about its ball-bearing as a center, while the arm 13 and the spring quickly adjust themselves to the lateral movement of the screw, said arm turning slightly about the knife-edge of its cross-head and the ring moving to a true bearing on the screw.

Having described my invention, I claim—

1. In a heliograph, a pivoted mirror-frame, a support having bearings for the frame-pivots, a gear fixed to the frame, a screw coöperating with the gear to turn the frame on its pivots, and a spring to hold the screw to its work in a yielding manner, the threads of said screw being truncated to permit its ready disengagement from the gear in operating the mirror by hand, substantially as described.

2. In a heliograph, a pivoted mirror-frame, a support having bearings for the frame-pivots, a gear fixed to the frame, a screw coöperating with the gear to turn the frame on its pivots, and a spring to hold the screw to its work in a yielding manner, the screw and spring being loosely connected by a bar, substantially as described.

3. In a heliograph, a pivoted mirror-frame, a support having bearings for the frame-pivots, a gear fixed to the frame, a screw coöperating with the gear to turn the frame on its pivots, and a spring to hold the screw to its work in a yielding manner, the screw and spring being loosely connected by a bar comprising a cross-head having an edge seated in the spring, substantially as described.

4. In a heliograph, a pivoted mirror-frame, a support having bearings for the frame-pivots, a gear fixed to the frame, a screw coöperating with the gear to turn the frame on its pivots, and a spring to hold the screw to its work in a yielding manner, the screw and spring being loosely connected by a bar, and the screw provided with a ball-bearing, substantially as described.

5. In a heliograph, a pivoted mirror-frame, a support having bearings for the frame-pivots, a gear fixed to the frame, a screw coöperating with the gear to turn the frame on its pivots, and a spring to hold the screw to its work in a yielding manner, the screw and spring being loosely connected by a bar, and the screw provided with a ball-bearing comprising a ball 19 held between the mirror-frame support and an adjustable plate 21, substantially as described.

6. In a heliograph, a pivoted mirror-frame, a support having bearings for the frame-pivots, a gear fixed to the frame, a screw coöperating with the gear to turn the frame on its pivots, and a spring to hold the screw to its work in a yielding manner, the screw and spring being loosely connected by a bar comprising a cross-head having an edge seated in the spring, and said head inclosed in the slot by the gear, substantially as described.

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

JULIEN P. FRIEZ.

Witnesses:
J. H. ALBRECHT,
GEO. H. KISPERT.