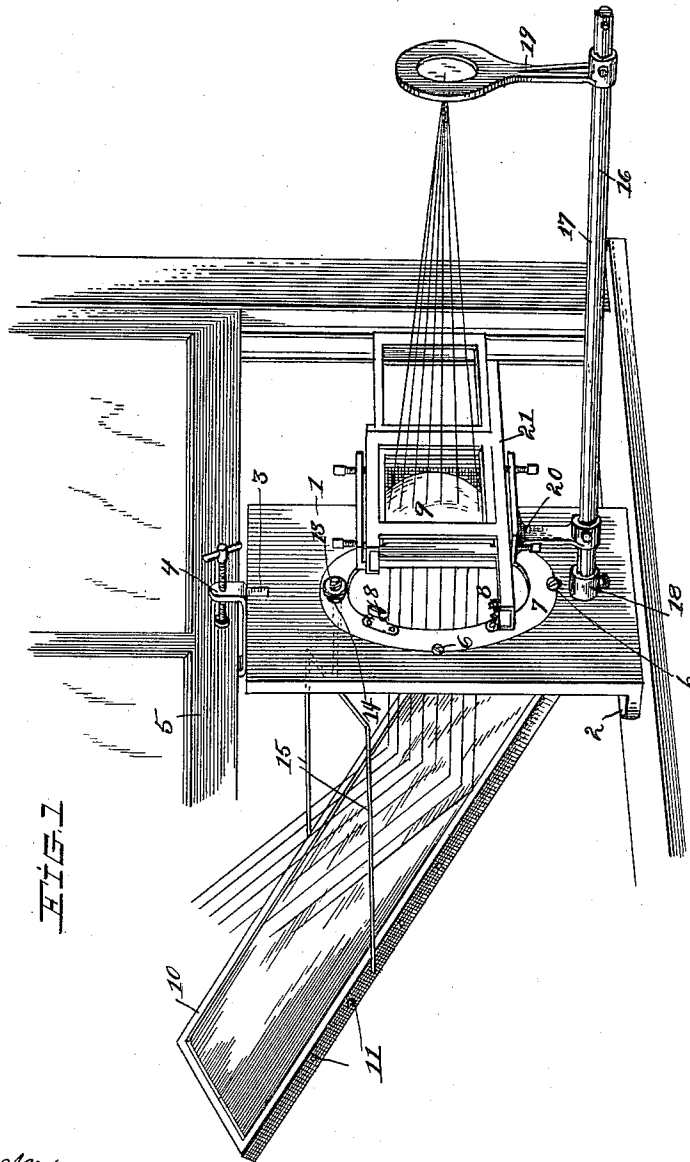


H. F. PATTON.
PROJECTING APPARATUS.
APPLICATION FILED SEPT. 9, 1910.

1,024,356.

Patented Apr. 23, 1912.

2 SHEETS—SHEET 1.



Witnesses.

Anna L. Lill.
Jno. T. O'Brien

Inventor.

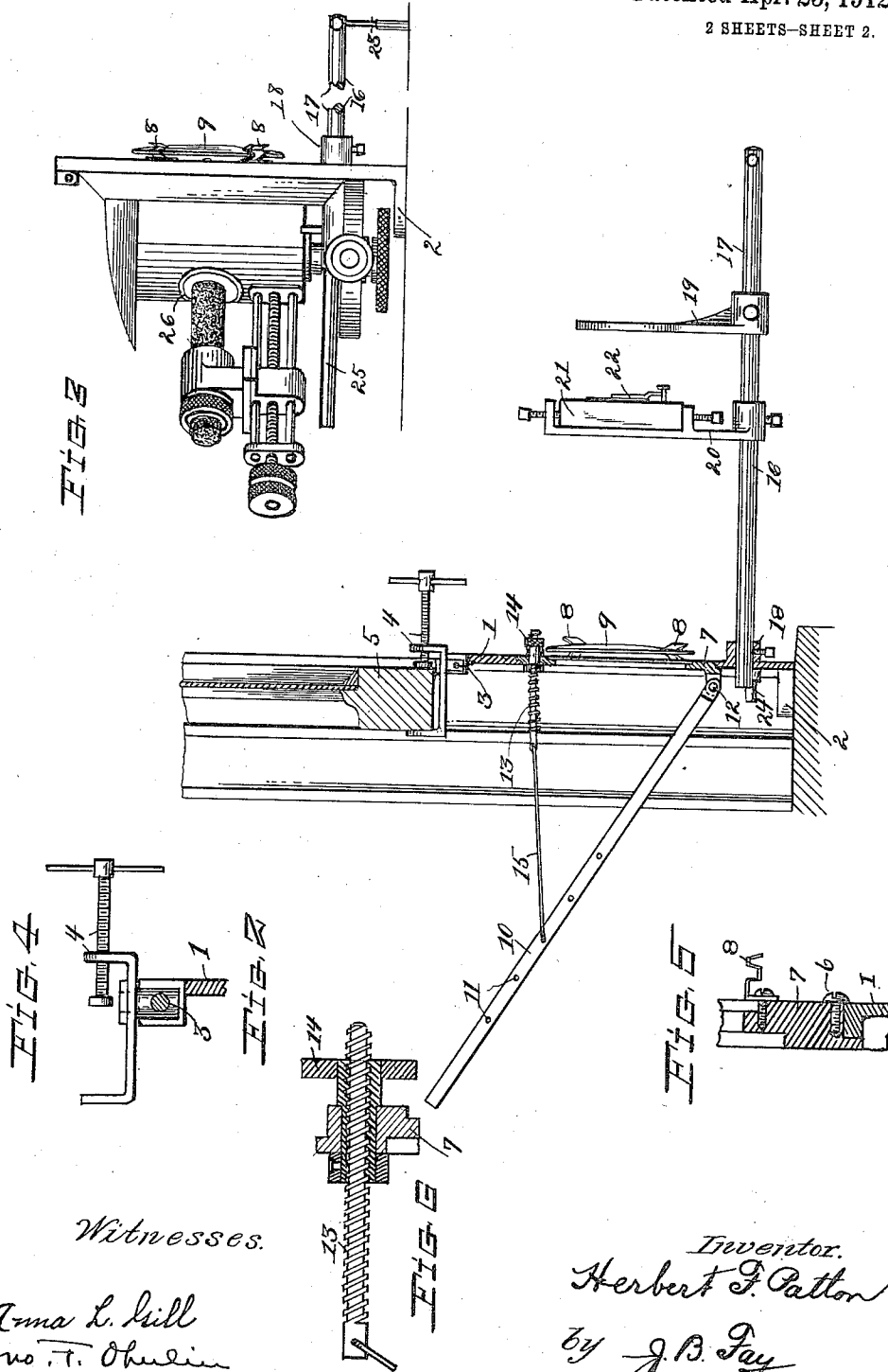
Herbert F. Patton
by J. B. Fay
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UNITED STATES PATENT OFFICE.

HERBERT F. PATTON, OF CLEVELAND, OHIO.

PROJECTING APPARATUS.

1,024,356.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed September 9, 1910. Serial No. 581,192.

To all whom it may concern:

Be it known that I, HERBERT F. PATTON, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Projecting Apparatus, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My present improved projecting apparatus is designed primarily for use as a *porte lumière* or solar lantern, although, as will be later indicated, arrangement is also made for the use of an artificial illuminant.

The object of the invention is the provision of an apparatus of the kind just referred to, that will be simple and inexpensive so as to be within the reach of individuals and schools that cannot afford more elaborate equipment. At the same time the present apparatus is designed to be equally accurate and as well finished in appearance as any of the more highly priced apparatus at present in the market.

To the accomplishment of the foregoing and related objects, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth, in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of the various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—Figure 1 is a perspective view of my improved apparatus arranged as a solar lantern for lantern-slide projection; Fig. 2 is a part side elevation and part central vertical section of such apparatus arranged for microscopic projection; Fig. 3 is a broken side elevation thereof (with parts omitted) as adapted for use with an artificial illuminant, specifically an arc lamp; and Figs. 4, 5 and 6 are sectional details on a somewhat enlarged scale.

The main element of the apparatus is an apertured plate 1, preferably made of some light metal, such as aluminum. This plate, having regard to the use of the apparatus primarily as a solar lantern, is adapted to be secured in an open window in the fashion clearly illustrated in Figs. 1 and 2. To this end the lower edge of the plate is provided

with a lateral flange or foot 2, while on its upper edge is mounted, by means of universal joint 3, a clamp 4 that is adapted to engage the sash 5 of the window when raised. By allowing the foot 2 to rest on the window ledge, after first securing the clamp on the upper edge of the plate to the sash, such plate is obviously held securely in place, despite the fact that it may be readily adjusted at any angle by slightly raising the sash and swinging it about the joint that connects it with the clamp.

Rotatably secured in the aperture in the plate, as by screws 6 (see Fig. 5), that bear thereagainst, is an annulus 7 provided on its one side with means in the form of spring clips 8 adapted to detachably hold a large or condensing lens 9, as shown in Figs. 2 and 3. To the other side of such annulus is pivotally attached at its one end, an oblong, preferably rectangular, mirror 10, which has a similar series of spaced engaging elements, such as holes 11, on each side. The mirror is thus secured to the annulus by means of a pin 12 that passes through registering lugs or ears on the two parts in question. At a point in the annulus, substantially diametrically opposite to the point of attachment of said mirror, is mounted a screw member 13, held in place by a nut 14 that is rotatably attached to the plate, as shown in Fig. 6. By rotation of such nut, accordingly, the member may be adjusted transversely of the plane of the annulus, as will be obvious. To the outer end of this member, is in turn pivotally secured a wire fork 15, the ends of which are formed to engage any desired pair of holes 11 on the sides of the mirror. By thus varying the points of attachment of the arms of the fork with the mirror, the inclination of the latter may be varied through a wide range, while a further and more exact adjustment is obtainable by rotation of the nut that engages the threaded member, to which said fork is attached at its inner end. At the same time by rotating the annulus, a corresponding rotative movement is imparted to the mirror, irrespective of its angle of inclination relatively to the plane of the annulus.

Detachably secured to the face of the plate corresponding with the lens-holding side of the annulus, so as to extend at substantially right angles thereto, is a rod 16 provided with a rib 17 so as to be held against rotation in the socket 18 in the plate,

provided for the reception of its inner end, and so as to adapt it to similarly non-rotatably support the projecting means proper.

The character of such projecting means will in part vary with the particular use being made of the apparatus. Thus where the latter is employed for lantern-slide projection, a holder 19 bearing a suitable objective will be supported on the shaft near its outer end, while near its inner end, or in other words, just in front of the aperture in the plate 1, will be supported a second holder 20 supporting both the condenser 9 and a slide-carrier 21, as shown in Fig. 1.

Where the apparatus is being used for microscopic projection, the objective holder 19 is moved somewhat nearer the plate and the second holder 20 brought up more closely thereto. The condenser is now secured in the clips on the front face of the annulus, as shown in Fig. 2, while such second holder carries a water cell 21 of familiar construction, to the front face of which the microscopic slide is adapted to be secured by suitable clips 22. The regular objective lens in the forward holder will, of course, likewise be exchanged for a microscopic lens.

When it is desired to use the apparatus with artificial illuminant in place of sunlight, the change may be readily effected. The mirror is easily and quickly removed by detaching the fork arms 15 and withdrawing the pin 12 pivotally connecting the end of the mirror with the annulus. Since in the case of such use the apparatus will not be clamped in a window, a foot in the form of a pin 23 is secured in the forward end of the rod 16 that supports the light-projecting means as shown in Fig. 3. While the lamp, constituting the source of light, may be placed directly on the table or other support, whereon the apparatus rests, it is desirable, particularly in using an arc lamp, that the latter be supported in relatively fixed relation with respect to the optical axis, which of course, coincides with the center of the aperture in the plate. I accordingly provide on the rear side of the plate, two lugs 24, to which may be secured tubular rods 25 that are adapted to form guides for the support of a lamp such as the arc lamp 26 appearing in the figure last referred to.

The foregoing described apparatus it will be seen, is not only quite simple in its construction, but is easily manipulated, whatever the arrangement of parts may be, whether for lantern slide or microscopic projection, and whether using sunlight or artificial light as the illuminant. The adaptability of the apparatus in the last particular especially, commends it for use in the home and small school.

Other modes of applying the principle of

my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In apparatus of the character described the combination of an apertured plate; an annulus rotatably secured in the aperture in said plate; a mirror pivotally attached at one end to said annulus, said mirror having a plurality of recesses disposed at intervals along the sides thereof; and extensible connections between said annulus and mirror, said connections being adapted to detachably engage said recesses.

2. In apparatus of the character described, the combination of an apertured plate; an annulus rotatably secured in the aperture in said plate; an oblong mirror pivotally attached at one end to said annulus, said mirror having a plurality of similarly disposed sets of recesses along the sides thereof; and extensible connections between said annulus and mirror, said connections being adapted to detachably engage said recesses.

3. In apparatus of the class described, the combination of an apertured plate; an annulus rotatably secured in the aperture in said plate; an oblong mirror pivotally attached at one end to said annulus; a member mounted in said annulus at a point substantially diametrically opposite to the point of attachment of said mirror and adjustable transversely of the plane of said annulus; and a fork pivotally attached to said member and having its arms connected with opposite sides of said mirror.

4. In apparatus of the class described, the combination of an apertured plate; an annulus rotatably secured in the aperture in said plate; an oblong mirror pivotally attached at one end to said annulus and having a similar series of spaced engaging elements on each side; a member mounted in said annulus at a point substantially diametrically opposite to the point of attachment of said mirror and adjustable transversely of the plane of said annulus; and a wire fork pivotally attached to said member and having the ends of its arms formed to engage selected engaging elements on the sides of said mirror.

5. In apparatus of the class described, the combination of an apertured plate; an annulus rotatably secured in the aperture in said plate; a rod detachably secured to one face of said plate so as to extend at substantially right angles, and adapted to support light-projecting means; means on the corresponding face of said annulus adapted to detachably hold a lens; means on the

other side of said annulus adapted to support a mirror in adjustable position relatively to the aperture in said plate; and means on the same side of said plate adapted to optionally support a lamp.

6. In apparatus of the class described, the combination of an apertured plate; an annulus rotatably secured in the aperture in said plate; a rod detachably secured to one face of said plate so as to extend at substantially right angles, and adapted to support light-projecting means; a foot detachably secured to the outer end of said rod; means on the corresponding face of said an-

nulus adapted to detachably hold a lens; a mirror detachably pivotally secured at its one end to the other side of said annulus; extensible means similarly detachably connecting said annulus with said mirror at a point removed from such end; and lugs on the same side of said plate adapted to optionally support a lamp.

Signed by me this 7th day of September, 1910.

HERBERT F. PATTON.

Attested by—

ANNA L. GILL,
JNO. F. OBERLIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."