

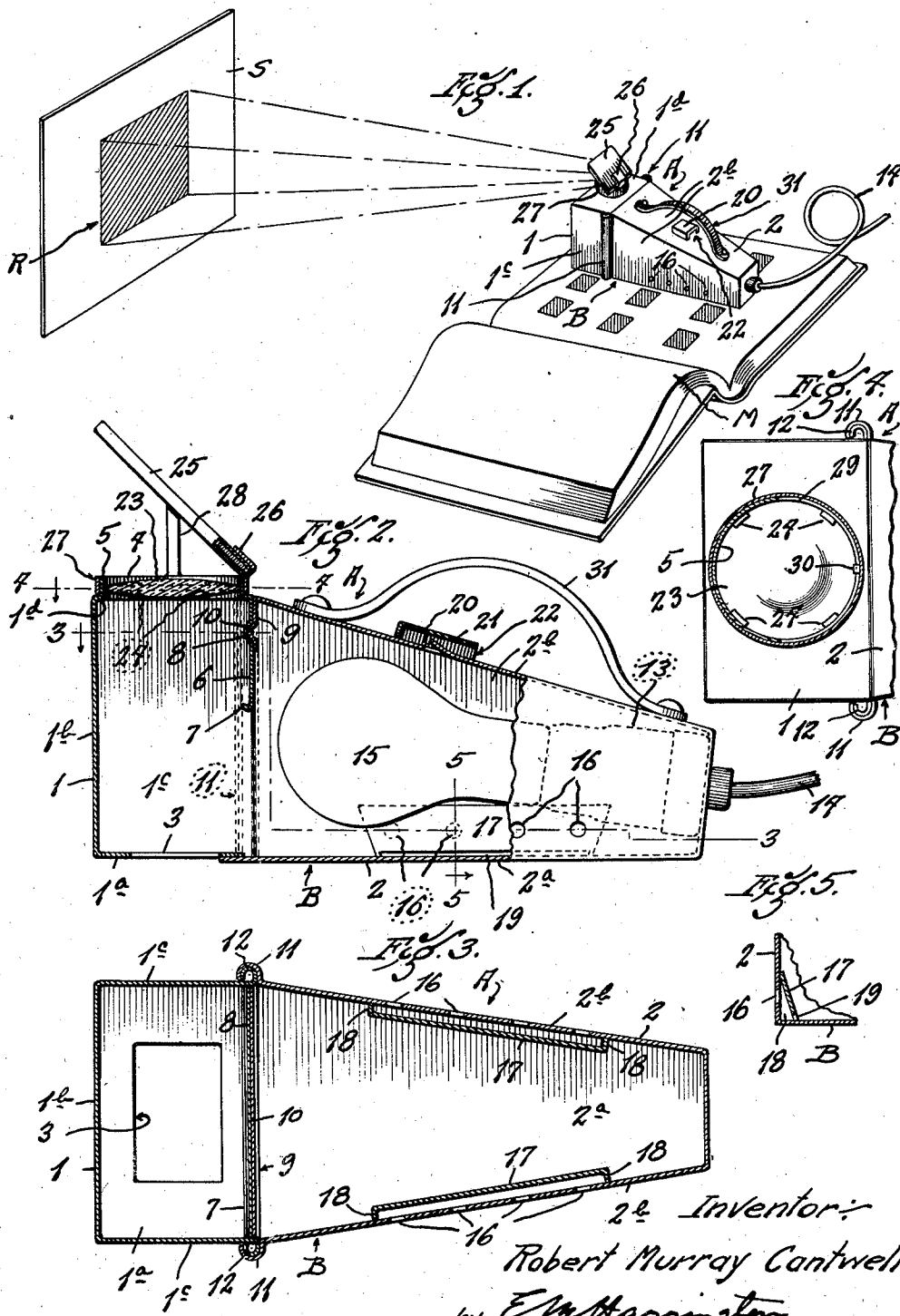
July 7, 1936.

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2,047,002

PROJECTING APPARATUS

Filed April 2, 1934



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UNITED STATES PATENT OFFICE

2,047,002

PROJECTING APPARATUS

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Application April 2, 1934, Serial No. 718,655

6 Claims. (Cl. 88-24)

This invention relates generally to projecting apparatus, and more specifically to a projecting apparatus which may be employed in projecting upon a suitable receiving surface enlarged reproductions of various articles such as stamps, small photographs, and numerous other articles of this general nature, the predominant object of the invention being to provide a small, compact, and completely portable apparatus of this type which may be employed in projecting enlarged reproductions of various articles upon a screen or other receiving surface without removing such articles from books, albums, mountings, etc., in or to which the articles may be permanently affixed.

It is quite generally known by persons familiar with such matters that individuals interested in philately usually mount the stamps of their collections in books. Also, it is common practice for persons who possess collections of small photographs to likewise safeguard the collections by securing the various photographs thereof in suitable books or albums. There has long been a need for a suitable small, simple, and compact projecting apparatus capable of projecting upon a screen or other receiving surface enlarged reproductions of stamps, photographs, and other articles, without removing such articles from the books, albums, or other mountings with which they are associated.

Realizing the presence of the need referred to above, I have devised the improved projecting apparatus disclosed herein which, briefly stated, comprises a housing of suitable shape which encloses a light source and has associated therewith suitable lens means for producing an enlarged optical reproduction of an article which is exposed to the interior of the housing through an opening formed through a wall of the housing. The apparatus includes also a reflecting element which is arranged in such position with respect to the lens means mentioned that the enlarged reproduction produced by the lens means is reflected by said reflecting element so that it is projected upon a screen or other suitable receiving surface. The improved projecting apparatus disclosed herein is very light in weight, and is so shaped and constructed that it may be moved freely about by hand and when used need only be arranged in proper relation to the article to be reproduced without disturbing the mounting of the article.

Fig. 1 is a perspective showing the improved projecting apparatus as it appears in use when an enlarged reproduction of a stamp, photograph,

or other article mounted in a book is projected upon a screen.

Fig. 2 is a view partly in longitudinal section and partly in side elevation of the improved projecting apparatus.

Fig. 3 is a horizontal section taken on the staggered line 3-3 of Fig. 2.

Fig. 4 is a horizontal section taken on line 4-4 of Fig. 2, the housing of the apparatus being broken away to conserve space.

Fig. 5 is a fragmentary section taken on line 5-5 of Fig. 2.

In the drawing, wherein is shown for the purpose of illustration, merely, one embodiment of the invention, A designates the improved apparatus generally. The apparatus A comprises a housing B which is preferably made in two parts which are detachably secured together, one part of the housing being the forward housing section 1 and the other part of said housing being the rear housing section 2 thereof. The rear section of the housing B includes a flat bottom wall 2^a and side and top walls 2^b, said side and top walls preferably being inclined from the larger forward end of the rear housing section to the smaller rear end thereof.

The forward housing section 1 is of substantial rectangular shape, comprising a bottom wall 1^a through which an opening 3 is formed, a front wall 1^b, opposite side walls 1^c, and a top wall 1^d. The top wall 1^d is provided with a circular opening 4 formed therethrough which is surrounded by an upstanding annular flange 5. At the rear of the forward housing section 1 an apron 6 is provided which extends downwardly from the top wall of said forward housing section, as shown in Fig. 2, said apron being extended from one side wall of the forward housing section to the opposite side wall thereof, as shown in Fig. 3, and being provided with an upwardly and forwardly extended flange 7 at its lower end. At a point spaced downwardly from the top wall of the forward housing section 1 the apron 6 is bent forwardly to provide a channel 8 which extends from one side of the apron to the opposite side thereof. At the forward end of the rear housing section an apron 9 is arranged which extends from one side of said rear housing section to the opposite side thereof. The apron 9 is bent to provide a bead or forwardly projected portion 10, which is adapted to enter the channel 8 in the apron 6. In this manner a light-proof joint between the front and rear housing sections is provided when said housing sections are in their assembled positions.

Located at the forward ends of the side walls of the rear housing section 2 are vertically disposed channel portions 11 which are open at the top wall of the rear housing section and extend downwardly to the bottom wall thereof. The channel portions 11 are formed by suitably curved portions of the side walls of the rear housing section 2. Formed at the rear ends of the opposite side walls of the forward housing section 1 are outwardly extended projections 12, which extend from the top wall of said forward housing section 1 to the bottom wall thereof. The projections 12 are formed by beading or rolling rear portions of the opposite side walls of the forward housing section, and these projections are located within the channel portions 11, as shown in Fig. 3, when the forward and rear housing sections are in their assembled positions.

When the forward and rear housing sections are being assembled, the forward housing section is elevated to a position where the projections 12 thereof may be inserted into the upper ends of the channel portions 11 of the rear housing section. The forward housing section is then moved downwardly with respect to the rear housing section, the projections 12 of the forward housing portion moving longitudinally of the channel portions 11 of the rear housing section until the bottom wall 1^a of the forward housing section contacts with the forward portion of the bottom wall of the rear housing section, as shown in Fig. 2. During downward movement of the forward housing section 1 with respect to the rear housing section 2, the aprons 6 and 9 yield due to the natural resiliency of these parts, and because said aprons are unattached at their opposite ends with respect to the forward and rear housing sections. This permits the apron 6 to move downwardly in sliding contact with the bead 10 of the apron 9, and when the forward housing section has reached its proper assembled position with respect to the rear housing section, said bead 10 snaps into the channel 8 of the apron 6 to provide the light-proof joint already referred to herein.

Fixedly mounted within the rear housing section 2 of the projecting apparatus A is an electric lamp socket 13 to which an electrical conductor 14 conducts electrical energy. The electric lamp socket 13 receives an electric lamp 15 in the usual manner, and said electric lamp extends forwardly toward the forward housing section 1, as shown in Fig. 2.

The operation of the electric lamp 15 within the rear housing section 2 causes heat to be produced within said rear housing section, and to provide for ventilation of the rear housing section I form a plurality of apertures 16 in each side wall thereof. These apertures are masked so that light may not pass freely therethrough, this masking of the apertures being accomplished by employing in association with each side wall of the rear housing section a wall 17, which is arranged with respect to said side wall as shown in Fig. 5. In other words, each wall 17 contacts at its upper end with the associated side wall of the rear housing section of the apparatus and is inclined downwardly away from the side wall toward the bottom wall of the rear housing section. At the opposite ends of the walls 17 short walls 18 are provided which extend from the walls 17 to the associated side walls of the rear housing section. Thus a boxing structure is arranged about the apertures which prevents free passage of light therethrough. The lower edge of the walls 17 are cut away slightly as indicated at 19 to pro-

vide a space for the passage of air into the interior of the rear housing section 2, the air passing through the apertures 16 and through the space referred to.

The top wall of the rear housing section 2 is likewise provided with a ventilating opening 20 (Fig. 2) which is masked by boxing structure 21. The boxing structure 21 is closed at its top, sides, and forward end, and is open at its rear end as indicated at the point designated by the reference character 22. Thus heated air may pass through the opening 20 and escape from the boxing structure at the open end thereof, while light is prevented from passing freely through said opening 20 by the enclosing boxing structure 21.

Located within the opening 4 formed through the top wall of the forward housing section is a lens 23. The particular lens shown is of the double convex type, but it is to be understood that different lenses may be used or a plurality of lenses employed if desired. The lens 23 is secured in place within the opening 4 by means of suitable clips 24.

Disposed immediately above the opening 4 is a reflecting element 25 which preferably is arranged at an angle of approximately 45° with respect to the plane of the lens 23. The reflecting element 25 may be of any suitable type; for instance, it may be in the form of a metal mirror, or if preferred it may be a glass mirror. The reflecting element is secured by a member 26 to an annular element 27, and this annular element surrounds the annular, upstanding flange 5 which surrounds the opening 4. Also suitable braces 28 extend from the annular element 27 to the opposite side edges of the reflecting element. The annular element 27 is capable of being rotated about the annular, upstanding flange 5 so that the reflecting element 25 may be positioned as shown in Figs. 1 and 2, or said annular element may be shifted about the upstanding, annular flange 5 so as to position the reflecting element adjacent to one or the other side of the opening 4. Thus the reproduction of the article being displayed may be projected forwardly of the apparatus A by positioning the reflecting element 25, as shown in Figs. 1 and 2, or said reproduction may be projected from one or the other side of the apparatus by shifting the reflecting element to one or the opposite side of the opening 4. In order to rotatably secure the annular element 27 to the annular, upstanding flange 5 I form a slot 29 in said annular, upstanding flange and provide the annular element 27 with a projection 30 which extends into said slot. The slot 29 extends approximately one-half the distance about the annular, upstanding flange, and as the annular element 27 is shifted about the annular, upstanding flange 5 to position the reflecting element at one or the other side of the lens, the projection 30 moves through the slot 29.

In the use of the improved projecting apparatus, the apparatus is arranged over the article to be projected as suggested in Fig. 1, wherein M designates a book in which such article is mounted and S designates a screen upon which the optical reproduction of the article is projected. The apparatus is so arranged with respect to the article that said article is exposed to the interior of the forward housing section 1 through the opening 3 formed through the bottom wall thereof. The electric lamp is then lighted, with the result that the housing of the apparatus will be flooded with light. The lens 23 produces an enlarged optical reproduction of

the article, and this enlarged reproduction is received by the reflector and is reflected thereby upon the screen S, as suggested at R in Fig. 1.

In order to facilitate moving and carrying the apparatus about, I provide a handle 31 which is suitably secured to the top wall of the rear housing section 2.

It is obvious that when it is desired to insert an electric lamp into the rear housing section, or remove said lamp from said rear housing section, access may be had to the interior of said rear housing section by merely removing the forward housing section. Also attention is directed to the fact that the aprons 6 and 9 provide a shield structure which prevents rays of light from being cast directly against the lens by the electric lamp. If desired the inner faces of the walls of the rear housing section 2 may be covered with aluminum paint or otherwise provided with light-reflecting faces by which the rays of light produced by the light source will be cast forwardly of the housing of the apparatus.

Because of the size and portable nature of the improved projecting apparatus disclosed herein, it may be used on an ordinary table, the book or other mounting of the article being projected being supported by the table, and the screen or other receiving surface being supported by the table or by an adjacent wall or other support.

I claim:

1. A projecting apparatus comprising a housing including a rear housing section and a forward housing section, means for detachably securing said rear and forward housing sections together, a light source within said rear housing section, a lens associated with said forward housing section, said forward housing section having a permanently unobstructed opening formed in the bottom wall thereof which is located in co-operative relation with respect to said lens and through which the article being projected is exposed to the interior of the forward housing section and to the lens, said housing being adapted to be supported by the support for the article being projected, with the bottom wall of said housing in contact with said support and with the article being projected exposed to the interior of the housing through the opening formed through the bottom wall of said forward housing section, and reflecting means disposed adjacent to said lens so that the projected article's optical reproduction produced by said lens will fall upon said reflecting means and be reflected thereby.

2. A projecting apparatus comprising a housing including a rear housing section and a forward housing section, means for detachably securing said rear and forward housing sections together, said means comprising portions on said rear and forward housing sections adapted for sliding engagement with each other, a light source within said rear housing section, a lens associated with said forward housing section, said forward housing section having a permanently unobstructed opening formed in the bottom wall thereof which is located in co-operative relation with respect to said lens and through which the article being projected is exposed to the interior of the forward housing section and to the lens, said housing being adapted to be supported by the support for the article being projected, with the bottom wall of said housing in contact with said support and with the article being projected exposed to the interior of the

housing through the opening formed through the bottom wall of said forward housing section, and reflecting means disposed adjacent to said lens so that the projected article's optical reproduction produced by said lens will fall upon said reflecting means and be reflected thereby.

3. A projecting apparatus comprising a housing including a rear housing section and a forward housing section, means for detachably securing said rear and forward housing sections together, a light source within said rear housing section, a lens associated with said forward housing section, said forward housing section having a permanently unobstructed opening formed in the bottom wall thereof which is located in co-operative relation with respect to said lens and through which the article being projected is exposed to the interior of the forward housing section and to the lens, said housing being adapted to be supported by the support for the article being projected, with the bottom wall of said housing in contact with said support and with the article being projected exposed to the interior of the housing through the opening formed through the bottom wall of said forward housing section, reflecting means disposed adjacent to said lens and at an angle with respect thereto so that the projected article's optical reproduction produced by said lens will fall upon said reflecting means and be reflected thereby, and means for adjusting said reflecting means with respect to said lens.

4. A projecting apparatus comprising a housing including a rear housing section and a forward housing section, means for detachably securing said rear and forward housing sections together, a light source within said rear housing section, a lens associated with said forward housing section, said forward housing section having a permanently unobstructed opening formed in the bottom wall thereof which is located in co-operative relation with respect to said lens and through which the article being projected is exposed to the interior of the forward housing section and to the lens, said housing being adapted to be supported by the support for the article being projected, with the bottom wall of said housing in contact with said support and with the article being projected exposed to the interior of the housing through the opening formed through the bottom wall of said forward housing section, reflecting means disposed adjacent to said lens and at an angle with respect thereto so that the projected article's optical reproduction produced by said lens will fall upon said reflecting means and be reflected thereby, and means movable about said lens for supporting said reflecting means.

5. A projecting apparatus comprising a housing including a rear housing section and a forward housing section, means for detachably securing said rear and forward housing sections together, interengaging portions on said rear and forward housing sections for providing a light-proof joint between said housing sections, a light source within said rear housing section, a lens associated with said forward housing section, said forward housing section having an opening formed in a wall thereof which is located in co-operative relation with respect to said lens and through which the article being projected is exposed to the interior of the forward housing section and to the lens, and reflecting means disposed adjacent to said lens so that the projected article's optical reproduction produced by

said lens will fall upon said reflecting means and be reflected thereby.

6. A projecting apparatus comprising a housing including a rear housing section and a forward housing section, means for detachably securing said rear and forward housing sections together, aprons on said rear housing section and said forward housing section adapted for contact with each other when said housing sections are assembled, the apron on one of said housing sections being provided with a channel which receives a projection on the apron of the other housing section, whereby a light-proof joint is provided between said aprons, a light

source within said rear housing section, a lens associated with said forward housing section, said forward housing section having an opening formed in a wall thereof which is located in co-operative relation with respect to said lens and through which the article being projected is exposed to the interior of the forward housing section and to the lens, and reflecting means disposed adjacent to said lens so that the projected article's optical reproduction produced by said lens will fall upon said reflecting means and be reflected thereby.

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