

Aug. 24, 1926.

F. A. JONES

1,597,598

APPARATUS FOR ENLARGING AND REDUCING OBJECTS

Filed August 29, 1924

2 Sheets-Sheet 1

Fig. 1.

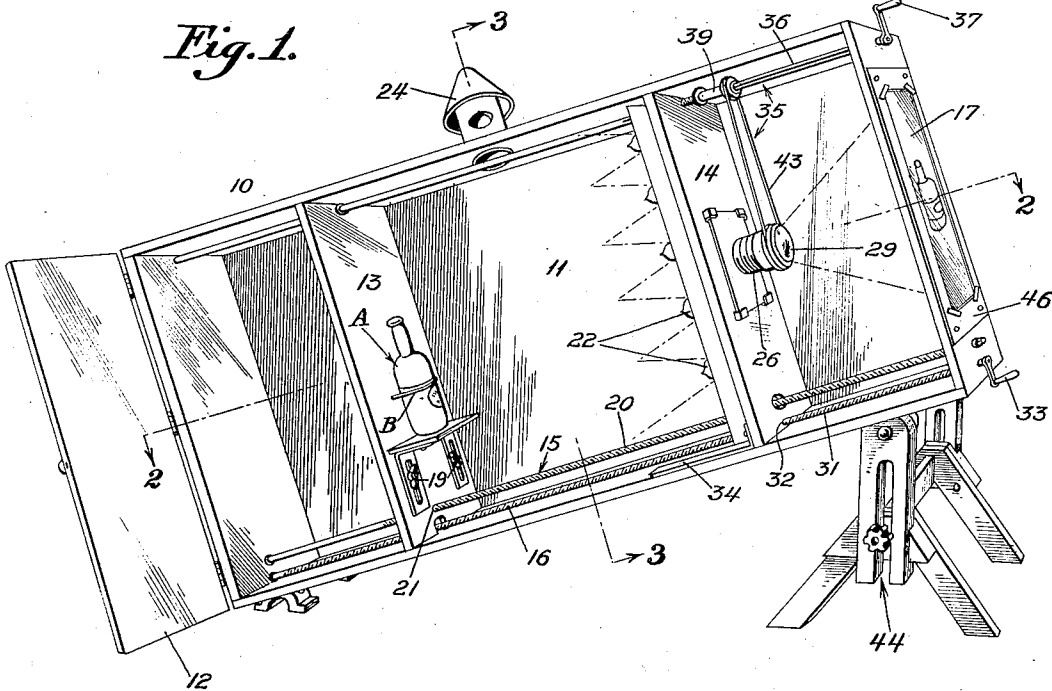
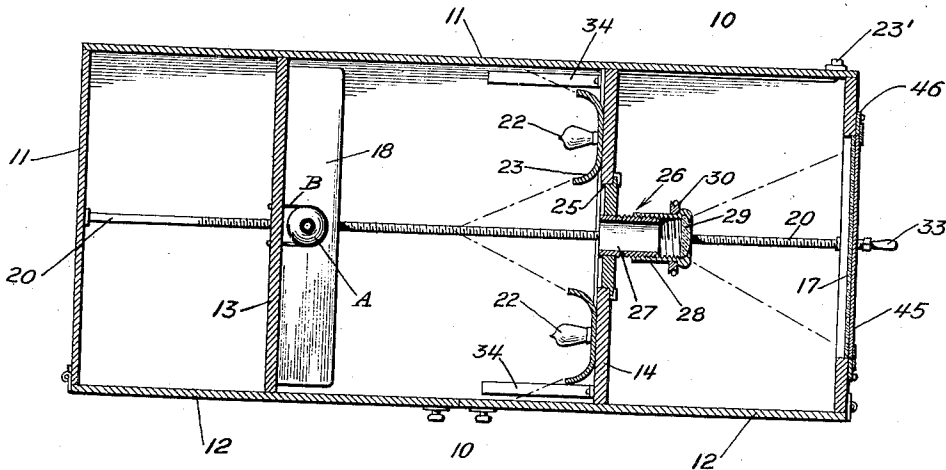


Fig. 2.



Paris A. Jones

INVENTOR

BY Victor J. Evans

ATTORNEY

WITNESS:

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F. A. JONES

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Fig. 3.

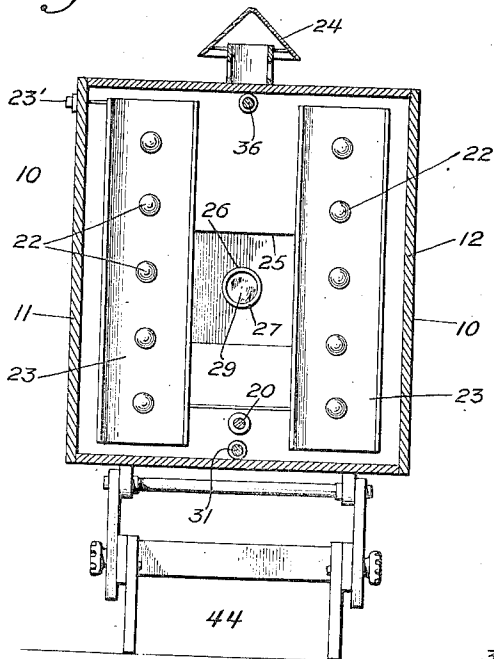


Fig. 6.

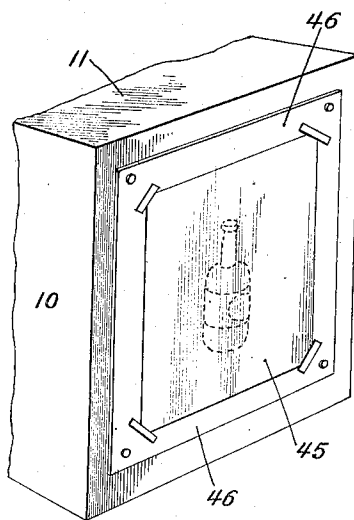


Fig. 4.

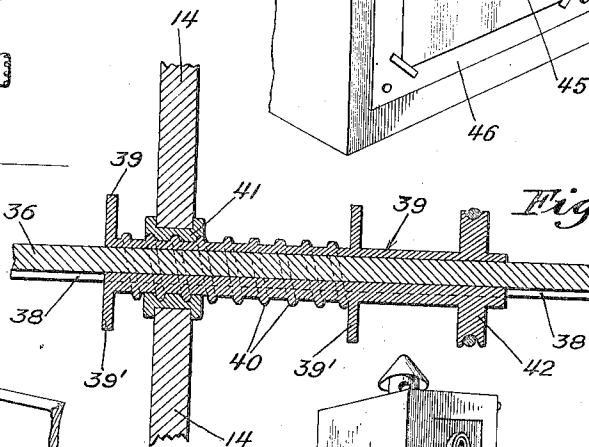
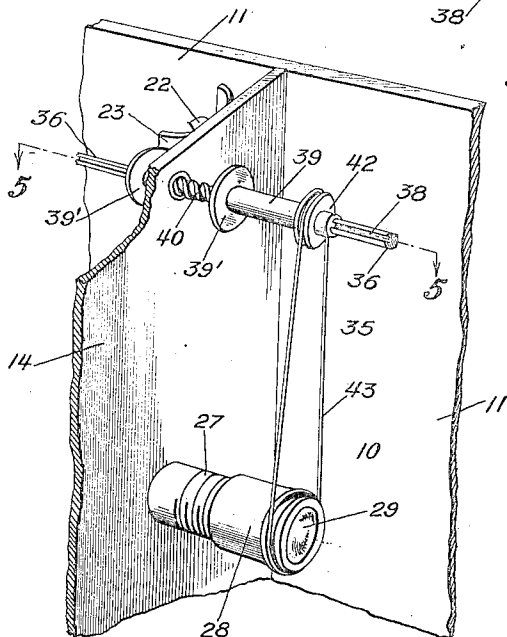
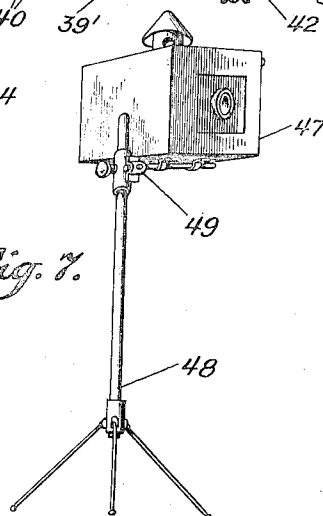


Fig. 5.

Fig. 7.



Faris A. Jones

INVENTOR

BY Victor J. Evans

ATTORNEY

WITNESS:
Gud Brutton

Patented Aug. 24, 1926.

1,597,598

UNITED STATES PATENT OFFICE.

FARIS ALFRED JONES, OF NEW ORLEANS, LOUISIANA.

APPARATUS FOR ENLARGING AND REDUCING OBJECTS.

Application filed August 29, 1924. Serial No. 735,006.

This invention relates to improvements in apparatus for enlarging and reducing objects for drawing purposes.

The principal object of the invention is the provision of an apparatus wherein the image of the object to be drawn is reflected upon a transparent surface where the same may be traced, and whereby the image may either be enlarged or reduced as the occasion demands.

Another object of the invention is to provide an apparatus which includes an object supporting panel, and a lens supporting panel, and a means for adjusting either panel with respect to the other, and means for adjusting the lens with respect to the panel adjusting means.

A further object of the invention resides in the construction of an apparatus of the class mentioned which is simple in construction, cheap of manufacture and easy of adjustment.

With these and other objects in view, the invention resides in certain novel construction and combination and arrangement of parts, the essential features of which are hereinafter fully described, are particularly pointed out in the appended claims, and are illustrated in the accompanying drawing, in which:—

Figure 1 is a perspective view of my invention with one of the doors removed.

Figure 2 is a longitudinal sectional view on the line 2—2 of Figure 1.

Figure 3 is a vertical transverse section view on the line 3—3 of Figure 1.

Figure 4 is a detail perspective view of the lens adjusting mechanism.

Figure 5 is a vertical sectional view on the line 5—5 of Figure 4.

Figure 6 is a detail perspective view of the manner of securing a sheet of drawing paper over the surface upon which the object is reflected.

Figure 7 is a perspective view of a modified form of my invention.

Referring more particularly to the drawing, the reference numeral 10 designates my invention in its entirety, and which includes a casing 11 in which access may be had from one side through doors 12 hingedly connected to the end walls. The casing is rectangular in configuration and has slidably mounted therein an object supporting panel 13 and a lens supporting panel 14, each panel

having separate adjusting means 15 and 16 respectively.

The front end wall of the casing has mounted therein a transparent window 17 which is countersunk within the front wall to be flat with the outer surface of the same.

The panel 13 as before mentioned is slidable in the casing and supports a shelf 18 which is vertically adjustable by a means 19. The shelf 18 is adapted to support the object to be enlarged or reduced, and in the present instance there is shown a bottle A which is positioned on the shelf centrally thereof and which is held to the panel 13 by a wire B which encircles the bottle and is secured to the panel to prevent the accidental shifting of the bottle during the tilting of the casing as will be hereinafter explained.

The longitudinal adjusting means 15 of the panel 13 comprises a screw rod 20 which has its bearings in the end walls of the casing and which freely passes through the panel 14, but which co-acts with a threaded opening 21 in the panel 13. One end of the rod 20 passes through the front end wall of the casing and is formed with a square surface for receiving a crank handle for imparting rotary movement to the rod. It will be seen that by turning the rod, the panel may be moved in either direction, depending upon the focus desired.

The panel 14 supports a series of electric light bulbs 22 on the rear face and reflectors 23 serve to throw the light from the bulbs onto the object as shown in Figure 2 of the drawing. A switch 23' is mounted on the exterior of the casing for controlling the operation of the lights. A ventilator 24 is mounted in the top of the casing between the panels and permits the escape of heat caused by the electric light bulbs.

The panel 14 is formed centrally with an opening 25, in which is mounted a lens mounting 26. The mounting 26 comprises sections 27 and 28 which are threadedly connected together for rotary adjustment. The section 28 carries a lens 29 for transmitting or refracting the light upon the transparent window 17, and the said section has keyed thereon, a pulley wheel 30 for a purpose to be described.

The adjusting means 16 is similar to the adjusting means 15 and comprises a screw threaded rod 31 likewise mounted in the

opposite end walls and beneath the rod 20. This rod has co-acting engagement with a threaded opening 32 in the panel 14, but extends freely through the panel 13. The front end of the rod 20 projects beyond the front end of the casing and receives a crank handle 33 for imparting rotary movement thereto. The handle is removable and is adapted for use in rotating the rod 20.

In order to limit movement of the panels 13 and 14 toward each other, I provide the panel 14 with inwardly extending stop members 34. These members co-act with the adjacent panel 13 to prevent the crushing of the bulbs should the panels be moved too close to each other.

I also provide an adjusting means 35 for adjusting the focus of the lens with relation to the initial longitudinal adjustment of the panel 14, and the said means comprises a shaft 36 which is journaled in the top of the end walls of the casing and is provided with a crank handle 37 for imparting rotary movement thereto. The shaft is formed with a horizontal slot 38 for a portion of its length.

A sleeve member 39 is slidable on the shaft 30 but turns with the same as the member is formed with a pin or rib which extends into the key way slot 38. The member is provided with a pair of stop flanges 39' for limiting the movement of the member in either direction and between the flanges 39', the exterior of the member is provided with screw threads 40 for co-action with a threaded bearing 41 mounted in the panel. From the description thus far, it will be seen that the member 39 will move with the panel during the operation of the adjusting means 16 as the same will slide on the shaft 36. The sleeve member carries a pulley 42 which may be integral with the member or keyed thereto over which passes an endless belt 43, which belt also passes over the pulley 30 of the lens mounting. We shall presume that the panel 14 has been initially adjusted and it is desired to further adjust the lens for clearly refracting or transmitting the image of the object on the transparent window. This is accomplished by turning the handles 37 which in turn will rotate with the shaft 36 which imparts rotary movement to the section 28 of the lens mounting to move the section 28 with respect to the section 27. Simultaneously with the adjustment of the section 28, the sleeve member will move in a similar direction by reason of the threaded connection in the panel 14 so as to always position the pulleys 30 and 42 in vertical alignment to prevent the belt from jumping the pulleys.

For adjusting the angularity of the casing and for supporting the same, I provide adjustable supporting means 44, whereby

the front end wall of the casing may be disposed at the proper angle for affording comfort to the user when tracing the image.

The image of the object placed upon the shelf 18 is reflected upon a sheet of paper 45 on which the object is to be drawn, which paper has its ends secured to a black cardboard frame 46 and which frame is held against the front end of the casing by thumb-tacks or the like. The black frame is adapted to seal the space between the drawing paper and the edges of the window to prevent light from passing there-through. With reference to Figure 6, it will be seen that the image of the object may be traced upon the drawing paper and the size of the image may be varied by the operation of the adjusting means 15, 16 and 35.

In Figure 7 I have shown a slightly modified form of device 47 wherein the desk or transparent window is left off and also the lens adjusting means, as the lens is exposed and may be adjusted in the usual manner. In this form, the image is adapted to cast a reflection upon a screen disposed forwardly of the lens. The device 47 is mounted upon a stand 48, and is both vertically and angularly adjusted by a means 49.

While I have described what I deem to be the most desirable embodiment of my invention, it is obvious that many of the details may be varied without in any way departing from the spirit of my invention, and I therefore do not limit myself to the exact details of construction herein set forth nor to anything less than the whole of my invention limited only by the appended claims.

What is claimed as new is:—

1. In a device of the class described, the combination of a casing having a transparent window in one end wall thereof, a pair of spaced panels, means for adjusting said panels longitudinally within said casing independently of each other, object supporting means carried by one of said panels, a lens structure threadedly mounted upon the other of said panels, an adjusting means for said lens structure operable independently of said panel adjusting means, said last adjusting means including a shaft journaled in said casing, a sleeve rotatable with said shaft and slidable thereover, said sleeve being threadedly mounted in said last mentioned panel, and means between said sleeve and said lens structure for imparting a turning movement to the lens structure upon rotation of said shaft.

2. An apparatus for enlarging and reducing objects comprising a casing having a transparent panel mounted in one end wall thereof, means for adjustably supporting said casing, a pair of panels slidable in said casing, separate adjusting means for moving said panels with respect to each other,

object supporting means carried by one of said panels, a lens mounted on the front face of the other of said panels, illuminating means carried by the other face of said panel for illuminating the object adapted to be supported by said object supporting means, whereby said lens is adapted to refract the image of the object through said transparent panel, and a sheet of paper arranged over said transparent panel for receiving the image.

3. An apparatus for enlarging and reducing objects comprising a casing having a transparent panel mounted on the end wall thereof, means for adjustably supporting said casing, a pair of panels slidable in said casing, separate adjusting means for moving said panels with respect to each other,

object supporting means carried by one of said panels, means for vertically adjusting said object supporting means, a lens mounted on the front face of the other of said panels, means for adjusting said lens with respect to its supporting panel, illuminating means carried by the other face of said panel for illuminating the object adapted to be supported by said object supporting means, whereby said lens is adapted to refract the image of the object through said transparent panel, and a sheet of paper arranged over said transparent panel for receiving the image.

In testimony whereof I have affixed my signature.

FARIS ALFRED JONES.