

Feb. 2, 1965

F. P. ROBIN

3,167,997

COMBINED ENLARGING AND PHOTOGRAPHIC MACHINE

Filed July 7, 1961

3 Sheets-Sheet 1

Fig. 1.

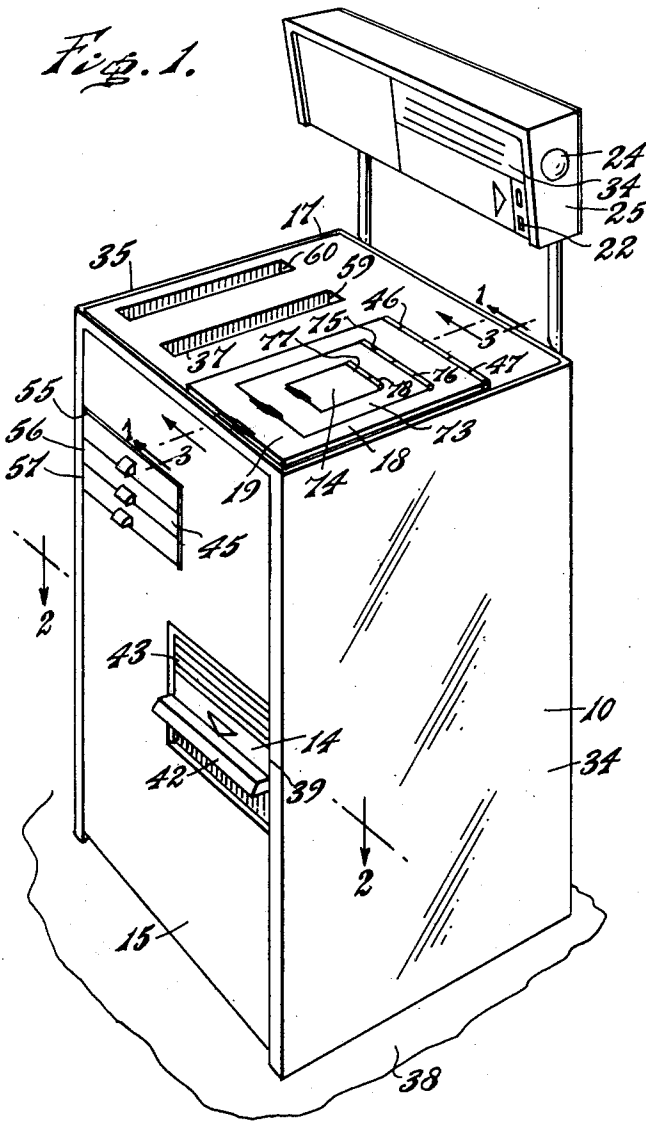
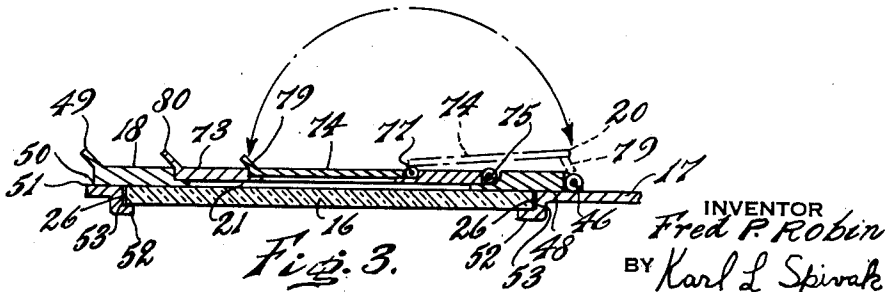
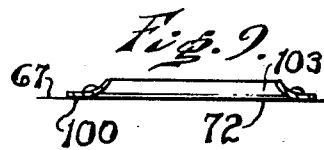
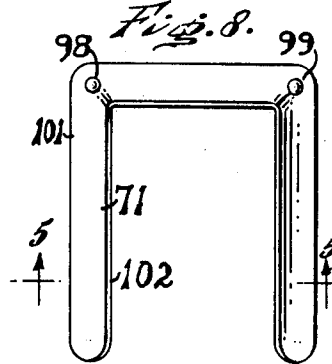
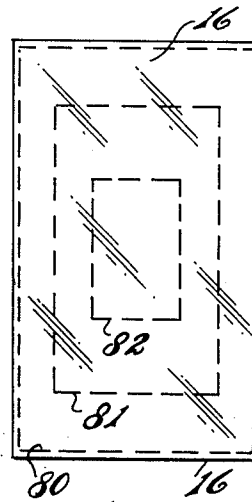


Fig. 2.



INVENTOR

Fred P. Robin

BY Karl L. Spivak

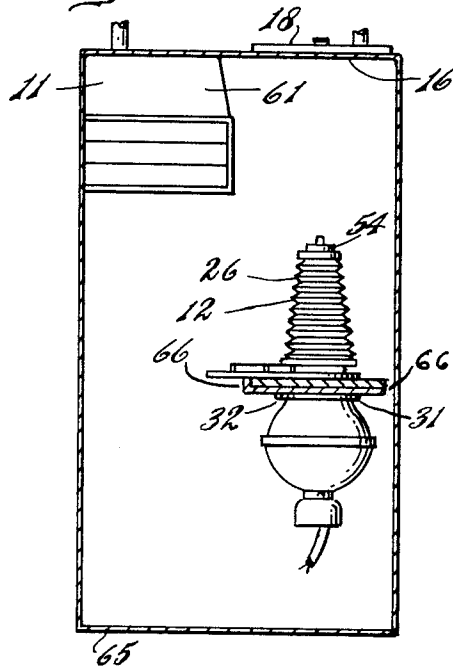
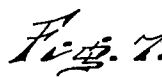
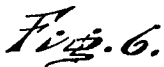
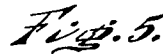
ATTORNEY

3,167,997

Filed July 7, 1961

35
1

Fig. 4. 17



INVENTOR
Fred P. Robin
BY *Karl L. Spivak*
ATTORNEY

Feb. 2, 1965

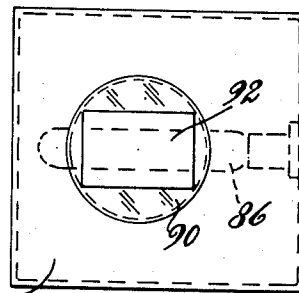
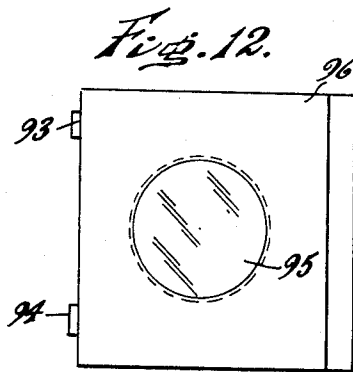
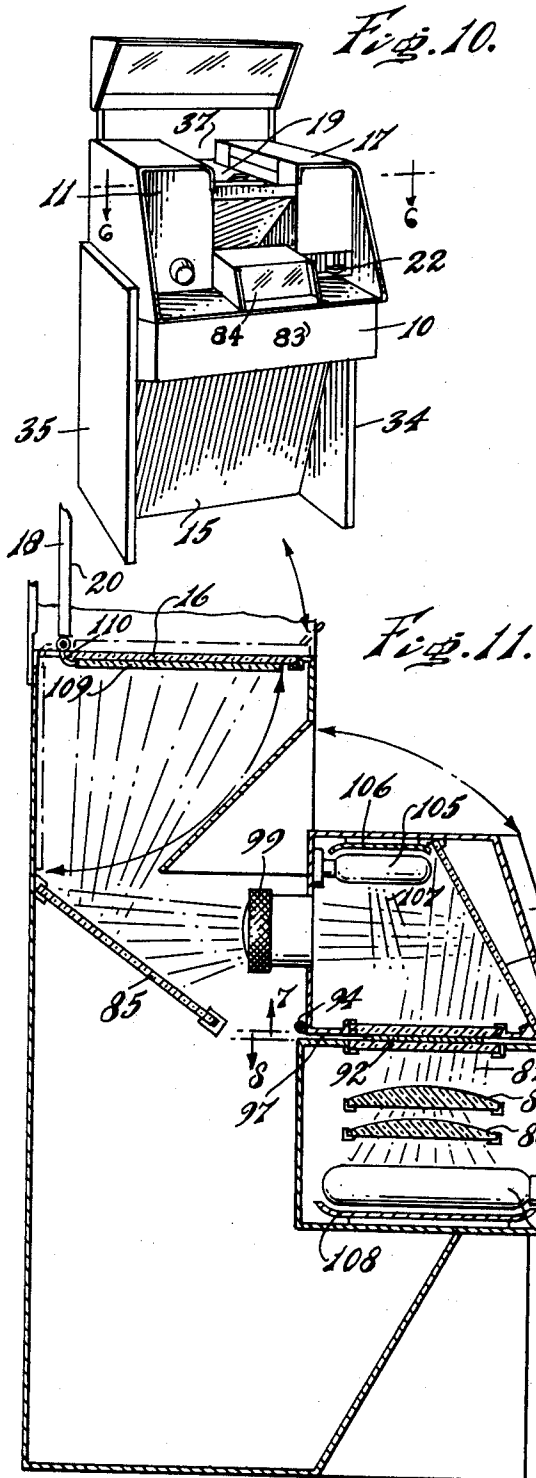
F. P. ROBIN

3,167,997

COMBINED ENLARGING AND PHOTOGRAPHIC MACHINE

Filed July 7, 1961

3 Sheets-Sheet 3



INVENTOR
Fred P. Robin
BY *Karl L. Spivak*
ATTORNEY

1

3,167,997

COMBINED ENLARGING AND PHOTOGRAPHIC MACHINE

Fred P. Robin, Cheltenham, Pa., assignor to Quik Photo-Electronics, Inc., a corporation of Pennsylvania

Filed July 7, 1961, Ser. No. 122,540

4 Claims. (Cl. 88—24)

This invention relates to photographic equipment and more particularly to a unitary device that incorporates means for both enlarging and producing almost instantaneous positive prints. The device is highly useful as a self-contained, semi-automatic, coin-operated vending machine type of device designed to provide enlargements to the public in general at a fraction of the time and cost presently required. The device incorporates novel structural features which insure the speedy operation thereof with the production of high grade enlargements.

It is therefore an object of this invention to provide a device that can be operated by members of the public not skilled in the photographic art.

Another object of my invention is to provide an enlarging and photographic device that will produce rapid, high grade enlargements.

Another object of my invention is to provide an enlarging and photographic device that may be operated outside of a conventional dark room.

Another object of my invention is to provide an enlarging and photographic device that is semi-automatic in operation and adaptable for coin operation.

Another object of my invention is to provide an enlarging and photographic device suitable for easy operation with various sized negatives.

Another object of my invention is to provide a coin operated copier for letters and the like.

Another object of my invention is to provide a device with simplified operation and controls that will produce rapid enlargements and/or contact prints.

Another object of my invention is to provide a device that is rugged in construction, simple in operation and relatively inexpensive in manufacture.

These and other objects and advantages and a fuller understanding of my invention will be more apparent from the following description and claims made in connection with the accompanying drawings wherein like reference characters refer to similar parts throughout the several views and in which:

FIG. 1 is a front perspective view showing the general arrangement of the equipment and enclosure.

FIG. 2 is a top view of the glass panel.

FIG. 3 is a fragmentary cross section of the glass panel cover taken along line 1—1 of FIG. 1.

FIG. 4 is a top plan view of the device.

FIG. 5 is a cross section taken along line 2—2 of FIG. 1.

FIG. 6 is a cross section taken along line 3—3 of FIG. 1.

FIG. 7 is a cross section taken along line 4—4 of FIG. 4.

FIG. 8 is a top plan of negative clip.

FIG. 9 is a cross section taken along line 5—5 of FIG. 8.

FIG. 10 is a front perspective of an alternate construction.

FIG. 11 is a cross section taken along line 6—6 of FIG. 10.

2

FIG. 12 is a cross section taken along line 7—7 of FIG. 11.

FIG. 13 is a cross section taken along line 8—8 of FIG. 11.

Although specific terms are used in the following description for the sake of clarity, these terms are intended to refer only to the particularly structure selected for illustration in the drawings and are not intended to define or limit the scope of the invention.

In the drawings, the enclosure portion of this invention is shown to comprise a generally rectangular equipment holder 10 upon which is mounted a self-contained developer 11 and within which a conventional enlarger 12 is carried in reversed vertical position upon a supporting upright 13. Access to the enlarger is provided by means of a readily openable door 14 in the front 15 of the equipment holder 10 and a glass panel 16 is arranged in the top 17 of the equipment holder to receive images (not shown) projected by enlarger 12. A cover plate 18 is held in hinged relation with the top 17 of equipment holder 10 and positioned to swing over glass panel 16 when in closed position 19 from normally open position 20 to hold paper 21 during enlarging operation.

The equipment holder 10 is provided with a conventional coin slot 22 shown mounted in side 34 or other suitable mechanism designed to start the operation of the device through operating circuit 23 wired into timing control 24 and enlarger 12. A locked coin receiver 25 of conventional design cooperates with coin slot 22 in the usual manner to provide a locked compartment for safe-keeping of money. Access to coin receiver 25 may be provided.

The enlarger 12 is mounted in reversed vertical position 26 upon vertical upright 13 in such a manner that an image may be projected upon the glass panel 16 provided in an opening 26 in the top 17 of equipment holder 10. Enlarger is held in vertical slidable relation with upright 13 by adjusting and clamping means 27 and current for operation is supplied through a three prong polarized plug 28 and conventional three wire cord 29 from any convenient 110 volt alternating current source. The enlarger may be secured to a mounting platform 30 by means of a bolting flange 31 and a plurality of bolts 32 as required to assure adequate stability. Alternate securing means may be employed for this purpose without departing from the scope of my invention. The mounting platform 30 is installed within equipment holder 10 in horizontal position and rests upon mounting clips 33 placed in each corner of the device. I have found it convenient to provide means to move the mounting clips vertically up and down in order to provide maximum ease in adjustment of the focus of enlarger 12 upon glass surface 16.

The equipment holder is shown to be generally rectangular in shape with top section 17, bottom section 65, sides 34, 35 and rear section 36, but this shape is not critical and may be altered as desired provided all equipment can be mounted in operating relationship to each other. I prefer the top 17 of equipment holder 10 to be approximately four feet high in order for the top surface 17 to offer a convenient working area 37 at suitable height when bottom 65 rests upon floor area 38.

An access opening 39 is provided in front 15 and as shown in FIG. 1, is preferably covered by operating door 14 which is directly connected to handle. The door 14 is operated by handle 42 and moves horizontally from

closed position 43 to open position 40 pulling negative tray 44. Negative tray 44 slides between guides 66 and carries a negative turntable 67 rotatably mounted thereon and centering a plurality of negative clamps 68, 69, 70. The various negative clamps are sized to hold various sizes of negatives and are each provided with a U-shaped spring clip 71 providing light spring pressure around the periphery of the negative 72 to securely maintain it during the enlarging operation. The turntable 67 is positioned upon tray 44 in such a manner to permit any desired negative clamp to be inserted in operable relation into the enlarger 12 when the negative tray 44 is in closed position 43. The number of negative clamps may be varied to accommodate the number of various sized negatives to be used. The spring clips 71 are secured to turntable 67 by rivets 98, 99 and have bottom 100 of outer edge 101 in contact with top surface of turntable 67 while inner edge 102 is arced up and away from said top surface a short distance 103 to facilitate insertion of negative 72. The turntable is cut and clear glass or plastic 104 inserted at each negative clamp 68, 69, 70 to provide a mounting surface for negatives 72.

The paper 21 is stored at a convenient location for operation with the device and a storage pocket 45 may be provided on one side of the equipment holder shown as the front 15 in FIG. 1. The storage pocket is welded, riveted or otherwise substantially connected for rugged operation.

The cover plate 18 is preferably constructed of the same material as the equipment holder 10 and is hinged at 46, 47 for pivotal operation on top 17. FIG. 1 shows cover plate 18 in closed position 19 and FIG. 11 indicates cover plate 18 in open position 20. A latch 49 on cover plate 18 cooperates with catch 50 on equipment holder 10 to furnish a readily operable means to lock cover plate 18 in closed position 19. I prefer to construct the cover plate 18 of size sufficient to overlap edges of glass panel 16 by a distance of approximately one-half inch on all sides and to provide a circumferential gasket 48 for seating the cover plate 18 when in closed position 19. Glass panel 16 is substantially flush with top surface 51 of equipment holder top 17 and is mounted in recessed flanges 52 provided around periphery of top opening 26. Flanges are recessed a distance 53 equal to the thickness of the glass used and may be pressed out of the same material used to form the equipment holder.

As shown in FIG. 1 and FIG. 3, I prefer to construct cover plate 18 with a series of smaller covered openings 73, 74, the number being changed to accommodate the number of various sized negatives to be used. Each covered opening is generally the same shape as cover 18 but smaller on all sides and is similarly hinged as shown at 75, 76, 77, 78 and provided with latches 79, 80. The smaller covered openings are arranged to cooperate with various smaller sized paper depending on the size enlargement desired and the entire cover 18 is arranged to provide a plurality of predetermined sized openings that may readily be chosen.

The glass panel should be of size sufficient to receive the entire projected image (not shown) from enlarger 12. I propose to arrange my invention in such a manner that conventional 35 millimeter negatives will be projected and enlarged by enlarger 12 to form a $2\frac{1}{2}$ x $3\frac{1}{2}$ inch image upon the glass panel 16. This may be accomplished by adjusting enlarger lens 54, clamping means 27 and vertical position 33 either together or singly. Similarly, post card size, 5 inch x 7 inch or 8 inch x 10 inch enlargements may be provided. If my device is to be operated by members of the public in general, I have found it convenient to mount one or more enlargers side by side in manner similar to that as shown with all settings adjusted so that each enlarger will produce only a predetermined size enlarged image from a given size negative thereby increasing ease in operation. An alternate construction using well known "zoom" lens in en-

larger 12 may also be employed whereby a fixed focus is always obtained upon the glass panel 16 and the operator need then only adjust for the final image size desired.

The sensitized paper required for operation of my device must possess characteristics of being relatively unaffected by ordinary daylight, being capable of exposure when subjected to the image projected by enlarger 12, being capable of being developed in approximately 10 seconds or less when introduced into developer 11 and capable of producing a glossy print. Such film is currently available and is known commercially as "stabilization paper." It is, of course, understood that any paper possessing the required characteristics may be utilized with my invention.

I prefer to mount the developer 11 directly underneath top 17 of equipment enclosure 10 in order to provide a convenient working location. The developer can be riveted, bolted or otherwise secured in place and is equipped with a light-tight enclosure 61 having an inlet slot 59 and outlet slot 60 opening directly upon top surface 17 for ease in operation. The required rollers (not shown) and film developing bath (also not shown) are arranged integrally in any well known manner.

In order to facilitate a coin vending machine type of operation, I have provided a plurality of paper drawers 55, 56, 57 at storage pocket 45. Each drawer contains different size paper and may be wired into the operation circuit 23 in such a manner that the opening of each is controlled by the amount of money inserted into coin slot 22.

The glass plate 16 is shown in FIG. 2 prior to mounting in equipment enclosure 10. Rectangular lines 80, 81, 82 are painted or scribed upon the top surface in spaced relation to the edges to cooperate with the various sized paper intended to be used with my invention. The lines are sized to be respectively slightly larger in all dimensions than the paper so that an unskilled operator may readily place the paper in correct position for best results.

The paper drawers 55, 56, 57 are provided with automatic dispensing means including a magnetic relay, required cams, and operating arm with rubber tip in contact with the sensitized paper 21 whereby one sheet at a time is ejected to the user in response to the coin operation.

In FIG. 10, I show an alternate method of practicing my invention utilizing a light projection box 83 and reflecting box 84 and reflecting surface 85. A conventional light source 86 is wired into operating circuit 23 as hereinbefore set forth and its beam 87 is directed upward through a pair of converging lenses 88, 89 by reflector 108. A negative carrying glass plate 90 is provided in the top 91 of projection box 83 and the negative 92 is centered and rested thereon. The reflecting box 84 is in hinged relation with box 83 and is vertically rotatable around hinges 93, 94. A corresponding glass surface 95 is arranged in bottom 96 of reflecting box 84 to fit directly over negative 92 when in lowest or closed position 97. A reflecting surface 98 within box 84 directs focused beam 87 from lens 88, 89 through enlarging lens system 99. The projected image of negative 92 is directed upon reflecting surfaces 85 in such a manner as to be both enlarged as desired and in turn reflected upon the underside of glass panel 16. The remaining photographic and developing operations are similar to those hereinbefore described.

An opaque copy light 105 is provided near top of reflecting box 84 with reflector 106 directing its beam 107 directly downward upon glass surfaces 90, 95 for use when direct copying of opaque prints or other material is desired. The beam 107 is arranged to reflect upon reflecting surface 98 and thence through lens system 99 same as hereinbefore set forth for negative operation. A switch (not shown) is wired into operating circuit 23 to control opaque material light 105 and light source 86 so that only one light operates at a given time depending upon whether a negative or a positive is being printed or copied.

5

A smoked or similarly treated glass or plastic panel 109 is provided at an angle of 90° from cover 18 and is pivotally connected thereto at 110 so that when cover 18 is closed, panel 109 will be in vertical position and out of path of reflected and enlarged beam. When cover 18 is in open position, the panel 109 will move up flush against underside of glass plate 16 and into path of reflected and enlarged beam thereby providing a convenient surface upon which the reflected image may be viewed when placing the sensitized paper 21 in position.

The operation of the device is as follows: First, the device is loaded by correctly placing the negative in the negative holder or inserting the opaque print as the case may be. Then the coin is inserted into the coin slot to activate the developer rolls and dispense the sensitized paper through operation of operating circuit 23. The access door 14 is opened as required for this operation.

The lens 54 may be adjusted to produce a clear image at glass panel 16 and a single sheet of sensitized paper is removed from automatic sensitized paper dispenser and placed with active face against glass panel. The cover plate 18 is then moved to closed position 19 thereby locking the sensitized paper 21 in proper position with respect to the image. Timing control 24 is next activated and the paper is exposed for the correct, predetermined length of time. Upon completion of the exposure of paper 21, cover plate 18 is moved to open position 20 and the paper inserted into inlet slot 59 of developer 11. In approximately 10 seconds, the finished, glossy enlargement is then removed from the outlet slot of developer 11 thereby completing the cycle. As can be readily understood from the design of my invention, the smallest cover 74 should be opened for use with the smallest scribed rectangle 82. As the paper size increases, corresponding larger cover openings and scribed rectangles should be used.

It should be noted that direct full size copies may be made by merely inserting the paper to be copied together with the sensitized paper between cover 18 and glass 16. The material to be copied thus should be placed between the light source and the sensitized paper. With the exception of the operations relating to placing and removing the negative, the cycle of operation for direct prints is the same as above set forth for enlarged prints.

Although I have described my invention with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

What is claimed is:

1. In a combined enlarging and photographic machine, the combination of

an equipment holding enclosure,

said enclosure having a top, a front, a back and parallel sides joining the front and back;

a mounting platform secured within the enclosure,

said platform having a plurality of positions permitting adjustment of the distance between the platform and the enclosure top;

an enlarger secured to the mounting platform,

said enlarger carrying adjustable lens and said enlarger directing a magnifying beam of light toward the enclosure top;

a negative holding tray slidably mounted in the enclosure front,

said tray rotatably carrying a negative holding turntable and

the said tray being positioned to introduce the negative turntable into the beam of light between the enlarger and the enclosure top,

the said turntable supporting a plurality of negative holding clips of varying sizes;

6

and a clear glass target provided in the said enclosure top,

said target being positioned to receive the magnified beam of light from the enlarger

and said target having a plurality of rectangular lines scribed thereon,

said lines defining rectangles of varying sizes arranged in spaced relationship

whereby a plurality of magnified images of various sizes may be focused in turn on the target and whereby a plurality of negatives of various sizes may in turn be accommodated.

2. The invention of claim 1 wherein a hinged cover pivots from the enclosure top and covers the glass target, said cover being provided with a plurality of smaller covers of decreasing dimensions, each of said covers being hinged to the next larger cover, and each said cover being sized to correspond to the size of one of said rectangles scribed on the glass target.

3. In a combined enlarging and photographic machine, the combination of

an equipment enclosure,

said enclosure being bounded by a top, a bottom, a front, a rear and enclosing sides;

a light projection box mounted in the front of the equipment enclosure,

said light projection box mounted in the front of the equipment enclosure, and supporting a negative carrying glass plate in the top thereof;

a light source wired into the light projection box at the bottom thereof, said light source directing its beam upwardly;

a converging lens system carried within the light projection box and disposed between the light source and the glass plate;

a reflecting box hingedly mounted above the light projection box,

said reflecting box provided with a glass plate mounted in the bottom thereof,

said glass plate being superimposed above the top glass plate of the light projection box;

an opaque copy light mounted at the top of the reflecting box,

the said light directing its beam downwardly;

a first reflecting surface mounted within the reflecting box,

the reflecting surface being positioned to receive and reflect the upwardly directed beam of light from the said light source, and

said surface being positioned to receive and reflect the downwardly directed beam of light from the opaque copy light;

an enlarging lens system mounted in the reflecting box, said lens system being positioned to receive and enlarge the reflected light rays from the first reflecting surface;

a second reflecting surface carried within the equipment enclosure,

said surface being positioned to receive and reflect the enlarged rays from the enlarging lens system;

and a clear glass target mounted in the top of the equipment enclosure,

said target being positioned to receive the reflected and enlarged rays from the second reflecting surface,

whereby enlarged and reflected images may be produced from either transparent or opaque objects.

4. The invention of claim 3 wherein an opaque cover and a translucent panel arranged at an angle of ninety degrees therefrom are hingedly connected to the enclosure top, the said cover having limited rotative motion

above the glass target and the panel having limited rotational movement below the said glass target.

References Cited by the Examiner

UNITED STATES PATENTS

1,635,741	7/27	Carpio	88—24
1,687,069	10/28	Iser	88—24
1,765,277	6/30	Kousminsky	88—24
1,914,461	6/33	Rodman	88—24
2,494,495	1/50	Tait et al.	95—38
2,552,225	5/51	Simmons et al.	88—24

5

10

2,593,318	4/52	Lehmann	88—24
2,664,038	12/53	Canham	88—24
2,751,814	6/56	Limberger	88—24
2,821,882	2/58	Goodkin	88—24
2,895,377	7/59	Manning	88—24
2,915,941	12/59	Finberg	88—24
2,927,503	3/60	Zollinger	88—24
3,065,667	11/62	Edgerton	88—24

NORTON ANSHER, *Primary Examiner*.

EMIL G. ANDERSON, *Examiner*.