United States Patent [19]

Diehl et al.

[11] **3,771,869**

[45] **Nov. 13, 1973**

[54] **PRINTING PLATE MAKER**

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[73] Assignee: **The Douthitt Corporation,** Detroit, Mich.

[22] Filed: **Feb. 26, 1973**

[21] Appl. No.: **335,492**

[52] **U.S. Cl.** **355/85,** 355/93, 355/94

[51] **Int. Cl.** **G03b 27/04**

[58] **Field of Search** 355/85, 91, 93, 94, 355/78, 61

[56] **References Cited**

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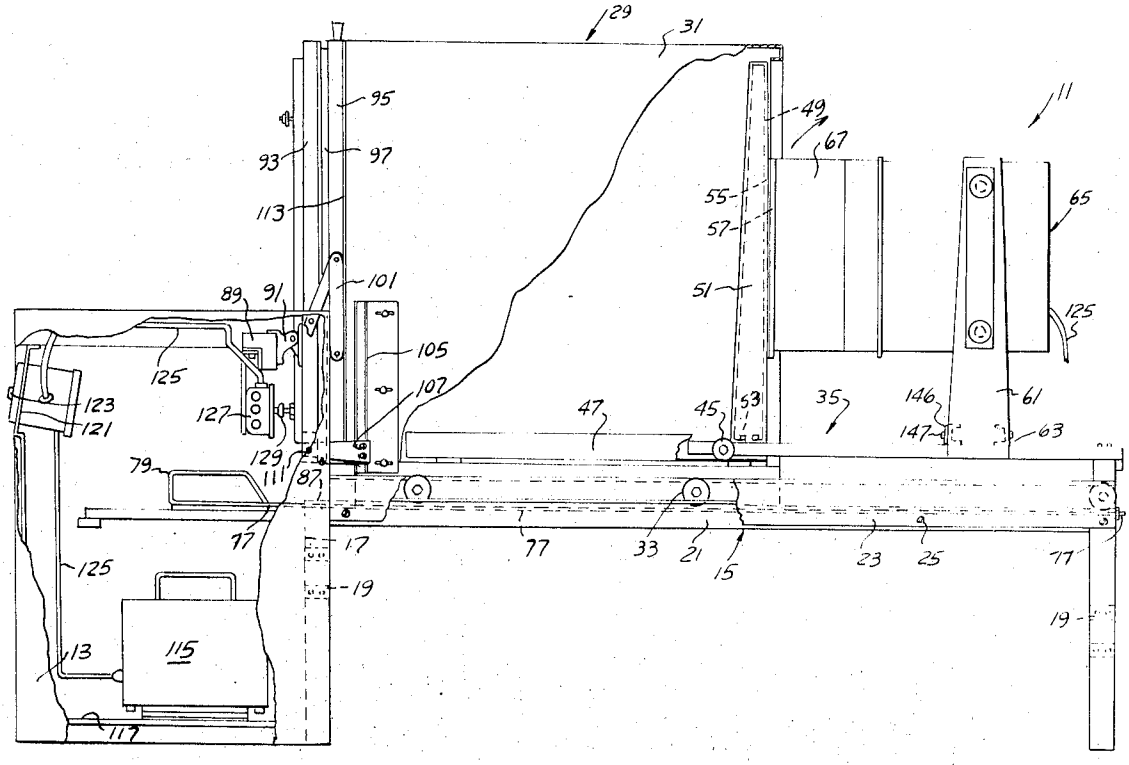
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Primary Examiner—Richard L. Moses
Attorney—Robert A. Sloman

[57] **ABSTRACT**

In a printing plate maker which has a body, a blanket frame pivoted thereon and a glass frame pivoted to the blanket frame, with both frames tiltable to an upright position, there is provided a rearwardly extending framework mounting channel tracks. An inverted U-shaped housing overlies said framework and has rollers supported in the tracks for longitudinal adjustments of the housing relative to the body. A high intensity light support frame overlies the framework and at its rear end has rollers guidably mounted in the channel tracks, with the forward ends thereof mounting additional rollers guidably mounted within opposed channels upon the interior of the housing wall for adjustment relative to the housing. The housing is adapted for adjustment independent of and relative to the light support frame. The light support frame upon the interior of the housing mounts an upright bellows plate which is apertured. A light frame extends transversely of the light support frame and is pivotally mounted thereon. A high intensity light source is secured to the light frame and includes a forwardly projecting hood which is supported upon and registers with the bellows plate aperture. A separate manual control rod is secured at one end to the under side of the light support frame and at its other end has a handle with associated pointer adapted to move with respect to a stationary longitudinally extending scale. Said rod by remote control manually regulates the center distance between the high intensity light on the light support frame with respect to the glass frame.

10 Claims, 4 Drawing Figures



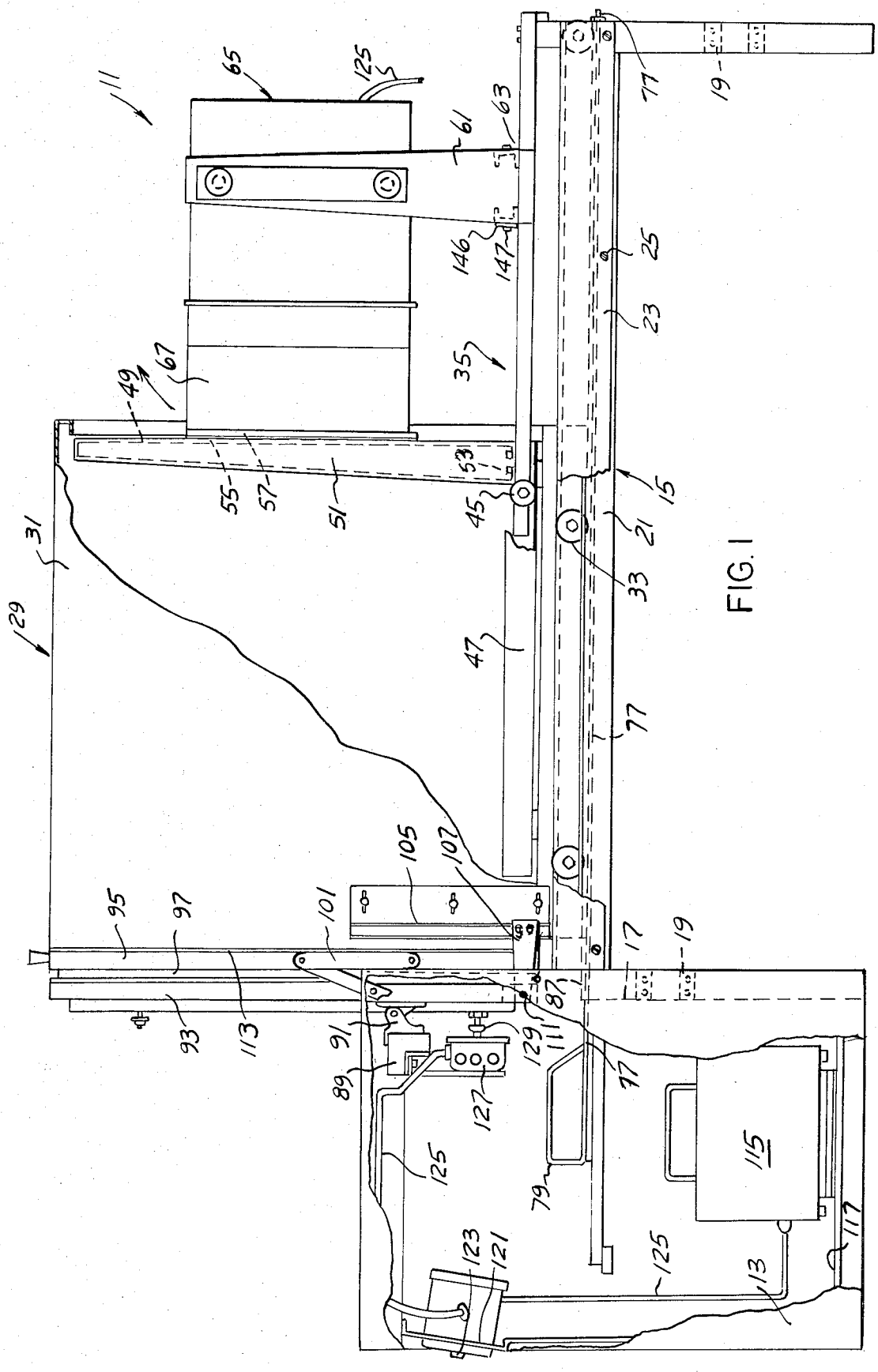

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FIG. 1

FIG. 4

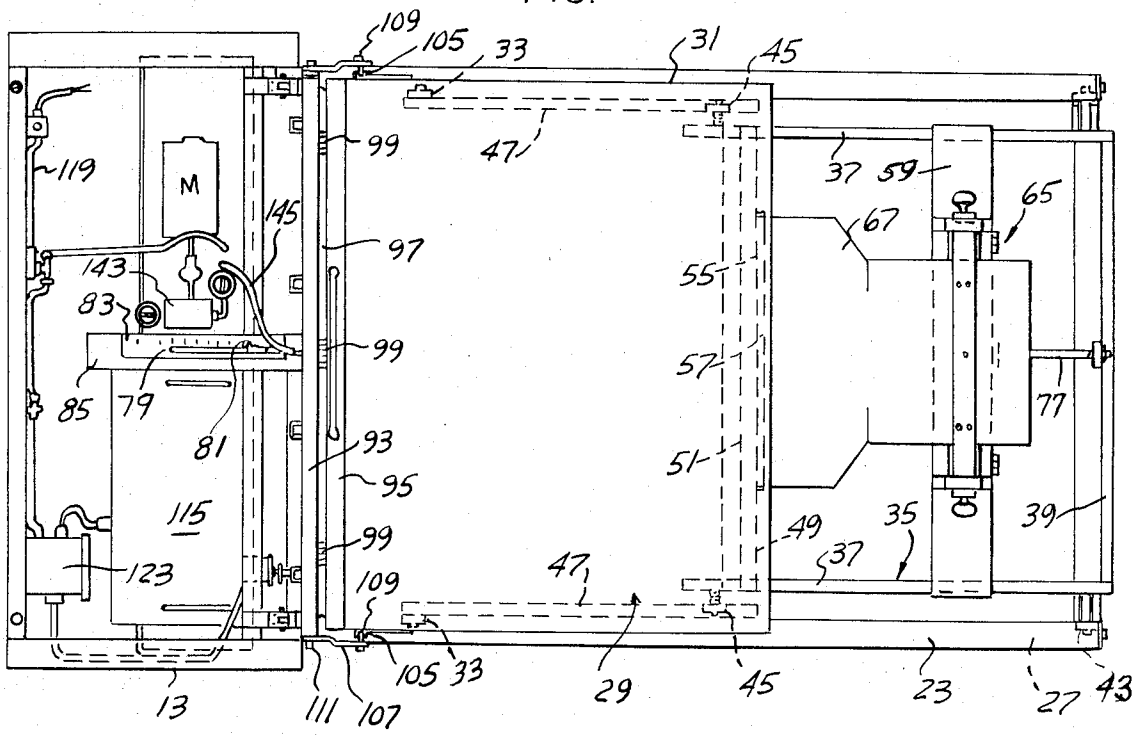
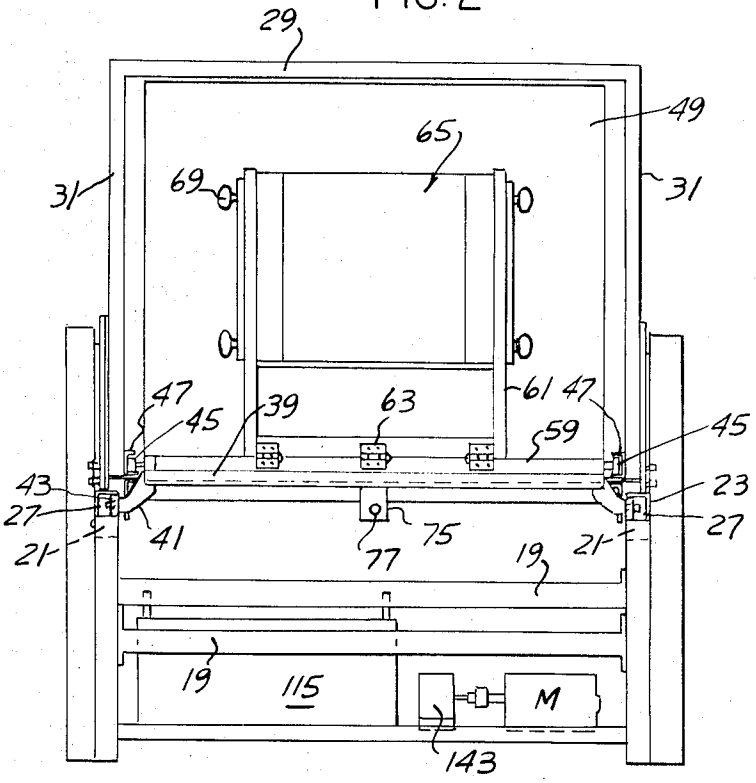

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FIG. 2


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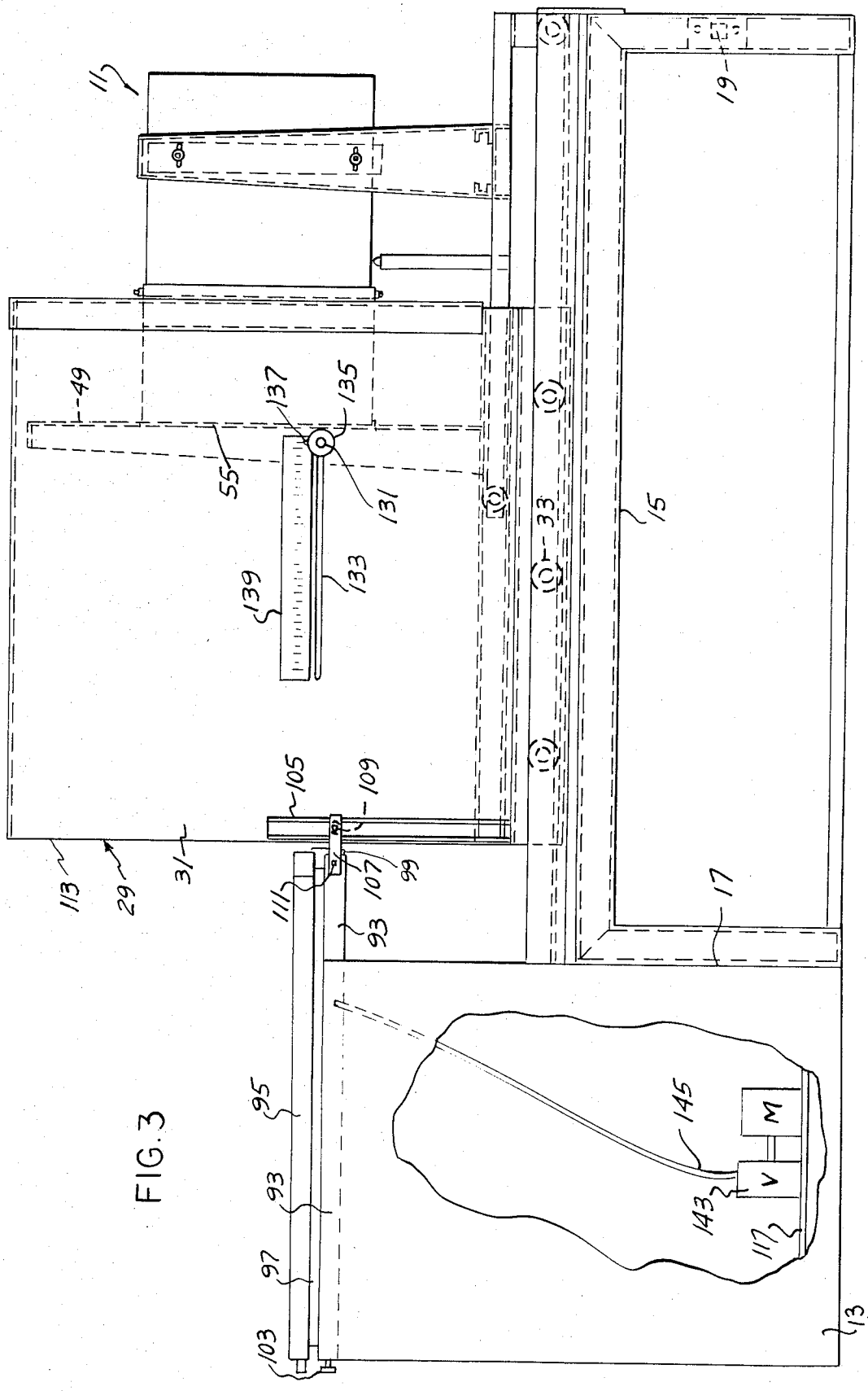

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FIG. 3

PRINTING PLATE MAKER

BACKGROUND OF THE INVENTION

Heretofore, there have been provided in printing plate makers of this type, self-contained light housings enclosing a light source but, wherein in the operation of the printer, the light source is at a fixed distance to the glass and blanket frames when in upright printing position. An example of this is shown in U.S. Pat. No. 3,106,145.

Heretofore, there has existed the problem that depending upon the loading and the amount of material employed in the assembly of a sensitized plate and film between the glass and blanket frames, the center distance of the light source could not be varied. It would be desireable, however to regulate the center distance of a high intensity light source with respect to the glass frame in an easy and convenient manner so as to employ the best center distance for the most efficient use of the printer and depending upon the extent of loading of materials between the blanket and glass frames and areas used.

BRIEF DESCRIPTION OF THE INVENTION

It is, therefore, an object of the present invention to provide an improved printing plate maker which in conjunction with the body which mounts the printing blanket and glass frames of a protective hooded housing which is adjustably positioned upon a framework, and which is in registry with the upright frames during printing and which provides a means of protectively enclosing the forwardly and rearwardly adjustable high intensity light source without exposing dangerous light rays to the eyes of people near the machine.

It is an object to provide in conjunction with an adjustable hood mounted upon a framework of a remotely controlled longitudinally adjustable light support carriage or frame mounting a high intensity light source, which may be moved within the light enclosing hood in such a fashion as to provide a means of adjusting the center distance between the high intensity light source and the glass frame during the printing operation.

It is another object to provide a suitable safety mechanism by which, should there be an accidental separation between the housing and the glass frame, the high intensity light source will be automatically deactivated.

These and other objects will be seen from the following specification and claims in conjunction with the appended drawings.

THE DRAWINGS

FIG. 1 is a fragmentary partly broken away side elevational view of the present printing plate maker;

FIG. 2 is a rear end elevational view thereof;

FIG. 3 is a side elevational view similar to FIG. 1, but showing the light enclosing housing spaced rearwardly from the body;

FIG. 4 is a plan view of FIG. 1 on a reduced scale.

It will be understood that the above drawings illustrate merely a preferred embodiment of the invention, and that other embodiments are contemplated within the scope of the claims hereafter set forth.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings, the present printing plate maker is designated at **11**, FIGS. 1 and 3, and includes

a conventional D frame body **13**. Framework **15** upon suitable legs, extends rearwardly of said body and is suitably anchored thereto as at **17**, FIG. 3, said framework being provided with suitable cross supports such as shown at **19**, FIG. 2.

Mounted upon said framework are a pair of parallel spaced tracks **21** closed at their ends which extend substantially the length of the framework. Overlying said tracks are the inwardly directed angle irons **23** anchored at **25**, FIG. 1, thereby defining a pair of opposed inwardly directed channels **27** upon the framework **15**.

Spanning said framework is the inverted U-shaped housing **29** whose opposed side walls **31** at their lower edges mount a series of rollers **33** which are movably positioned within the channels **27** upon the respective tracks **21**.

A separate independently adjustable light support frame **35**, FIGS. 1 and 3, overlies the framework **15**, includes the parallel spaced side members **37** and corresponding reinforcing cross members **39**.

A pair of brackets **41** depend from the side rear portions of the light support frame, FIG. 2, and mount rollers **43** which are nested within channels **27** and upon the respective tracks **21** to provide a rear slide support for the light support frame.

Upon the interior walls of the housing at their lower edges are a pair of inwardly directed channels **47** which are horizontally disposed adapted to receive the side rollers **45** journalled at the sides of and at the forward end of the light support frame for movable positioning therein.

Thus the sets of rollers **43** and **45** provide the support mounting for the light support frame for movably mounting said frame upon the framework **15** and at the same time, with the forward end of the light support frame movably mounted and supported upon and within the housing **29** for adjustments relatively thereto such as shown in FIG. 3.

Upright bellows plate **49** having a continuous peripheral flange **51** is mounted upon and extends transversely across the forward end of the light support frame **35** and is secured thereto as at **53**, being centrally apertured as at **55**, FIGS. 1 and 3.

Angle members flanges **57** are mounted along the sides and bottom of said aperture and extend rearwardly thereof adapted to supportably receive and protectively enclose the forward edges of the reflector hood **67** upon the high intensity light assembly **65**.

Intermediate the ends of the light support frame is provided the transverse support plate **59** between the side members **37**. The light support **61** which adjustably mounts the high intensity light source at **69**, FIG. 2, at its lower end rests upon light support plate **59** and is hingedly connected thereto by a series of hinges **63**. The housing for the high intensity light assembly includes the forwardly directed hood **67** which has certain interior reflectorized surfaces. The forward open peripheral edge of said hood as shown in FIGS. 1 and 3 rests upon the continuous U-shaped flange **57** which is mounted relative to the central aperture **55** of the bellows plate **49** and is adapted to supportably receive the complete light assembly and hood in the horizontally disposed position shown.

Since there is no flange **57** at the upper edge portion of the aperture of the bellows plate **49**, and in view of the hinge mounting at **63** of the support **61**, the complete light assembly **65** including the hood **67** may be

tilted upward as desired for disengagement from the bellows plate **49**, and for access into the light source.

In the illustrative embodiment, some form of releaseable detent is employed for normally anchoring the frame **61** in the upright position shown.

For illustration, there is shown in FIG. **1** the detent **146** pivotally mounted at **147** on a portion of the light support frame and in one position will normally retainingly engage the frame **61**, holding the same in upright position. To tilt the frame rearwardly, it is merely necessary to disengage the detent **146**.

The present light assembly **65** is a high intensity light source providing ultra-violet light and is commercial in character and may be purchased on the market. One illustration thereof is a mercury vapor metal halide lamp, having a suitable air cooling blower which is adapted to provide a high intensity light in the power range of 1 to 10 kilowatts, for illustration.

It is contemplated that the light support frame **35** is manually adjustable by remote control to provide a means of regulating the center distance between the light source within the light assembly **65** and the surface of the glass plate **95** when it is tilted into printing position. For this purpose, there depends from the light support frame **35**, a bracket plate **75**, FIG. **2**, to which is connected one end of the pull rod **77**.

Said pull rod extends longitudinally of the light support frame thereunder, below and through the housing **29**, through a suitable guide at **87** and into the interior of the body or D frame **13**, terminating in the handle **79**.

Said handle carries a laterally extending pointer **81** which is adapted for selective registry with the longitudinally disposed scale **83** mounted upon scale support **85** at its free end supported by said body as in FIG. **1**.

The scale **83** is normally marked off in certain indicia such as inches, to designate variations in the range of 45 to 55 inches for example, being preselected center distances between the high intensity light source within the light assembly **65** and the glass blanket **95** when in the upright position shown in FIG. **1**.

Accordingly with the glass and blanket frames tilted to the upright position shown in FIG. **1**, by manual application to the handle **79**, the pull rod **77** and pointer **81** may be adjusted relative to the scale to preset longitudinal adjustment of the light support frame upon the framework and within and with respect to housing **29**.

As a part of the conventional D frame body **13**, FIG. **1**, there is provided a suitable cross support **89** with hinges **91** for mounting the blanket frame **93**. Said blanket frame is shown in horizontal position in FIG. **3**, resting upon the bed of frame body **13**.

A conventional glass frame **95** is superimposed over the blanket frame in cooperative sealing registry with the continuous bead **97** forming a part of the blanket frame. The glass frame is of the usual conventional constructon and as shown in FIG. **3** is connected at its rear to the rear portion of the blanket frame by the hinges **99**. By this construction and with latch **103** holding the blanket frame **93**, FIG. **3**, the glass frame **95** may be tilted upwardly with respect to the stationary blanket frame as desired, such as to an upright position. In the normal conventional operation of the printing frame assembly with the blanket frame horizontal and with the glass frame upright, the blanket frame is loaded by applying thereto a suitable presensitized strip of material such as a plate with a sensitized surface or emulsion, which may extend over a portion of the blanket or over all of the blanket. Thereover is positioned in a conventional manner, a suitable film or other transparency. Afterwhich, the glass frame is tilted down horizontally into snug sealing registry with the blanket frame and held in such sealing registry by the spring biased toggle linkage **101**.

There is shown fragmentarily in FIG. **1** a conventional linkage at **101** which at its free end portion is spring biased to the frame body **13** in the manner shown in FIG. 4 of U.S. Pat. No. 3,106,145 which construction does not form a part of the present invention, and thus, further detail is omitted. The linkage **101** is in the nature of a spring biased toggle linkage which will normally bias the glass frame into cooperative registry with the blanket frame such as in the horizontal position shown in FIG. **3** and which will also function to hold both frames in cooperative sealing registry when said frames have been tilted to the upright printing position shown in FIG. **1**. This is also to facilitate separate opening of the glass frame **95** relative to the blanket frame **93**, FIG. **3**.

Mounted upon the side wall of said housing on its opposite sides are a pair of outwardly directed upright side channels **105**, FIG. **3**. The pair of links **107** are flexibly and pivotally connected at their one ends as at **111** to rear portions of the blanket frame. Forward ends of said links mount rollers **109** which cooperatively nest within the corresponding side channels **105**.

With the two frames **93** and **95** in the horizontal set up position shown, rear portions of said frames extend rearwardly of the frame body **13**, with links **107** moving the protective housing **29** rearwardly of said body, FIG. **3**. Accordingly, after the frames have been loaded and ready for printing, they are tilted in unison to the upright position shown in FIG. **1**. At the same time, through said linkage, housing **29** moves forwardly so as to be closely adjacent the body **13**. Thus the front edge of the apertured wall of said housing at **113** is in snug registry with glass frame **95**, as shown in FIG. **1**.

There is schematically designated a conventional type of electrical power pack **115** which includes connections to a suitable power source, that is mounted upon floor **117** within said body and includes power cable **119**, broken away, which is adapted to provide electrical power to the high intensity light source at **65**.

Across the front of body **13**, there is provided a suitable panel **121** upon which is mounted manually operable timer **123** for regulating the time of exposure or activation of the high intensity light source. This timer by suitable conduit **125** is connected to power pack **115**.

As a safety feature and to prevent accidental exposure of ultraviolet light rays to an observer or a worker there is provided a safety limit switch **127** which depends from the cross support **89**, FIG. **1**, and is connected by the conduit **125** to the timer. Said limit switch is normally open and is activated to close the circuit to the timer when the blanket frame **93** has been tilted to the upright position shown in FIG. **1**, with pin **129** in registry with the limit switch. Should there be any accidental or other forward tilting of the frames **93** and **95**, limit switch will be automatically opened cutting off power to the high intensity light source.

Referring to FIG. **3**, there is shown an alternate method for effecting automatic remote independent longitudinal adjustment of the light support frame **35**

with respect to the framework **15** and also with respect to the enclosing housing **29.**

For this purpose, there is provided a laterally extending rod **131** which at its inner end is connected to a portion of bellows plate **49** and extends outwardly through the elongated horizontally extending slot **133** in the housing terminating in a suitable handle **135.**

On said handle is a suitable pointer **137** adapted to selectively register with the longitudinally disposed scale **139** upon the side wall of said housing along and adjacent slot **133.** By this construction the light support frame **35** may be adjusted longitudinally with respect to the glass frame **95** when it is used in an upright position merely by sliding adjustment of handle **135.** In this case as distinguished from the rod **77** of FIG. **1,** adjustment can be accomplished without tilting the blanket and glass frame to an upright position.

Asserted as conventional construction and further shown in detail in the earlier issue of U.S. Pat. No. 3,106,145, within the body **13** there is provided upon floor **117** a suitable motor M connected to a vacuum producing source **143** which, through a flexible conduit **145,** provides vacuum to the upper surface of the blanket frame **93** for use in a conventional manner. This provides for contact exposure printing and wherein the flexible blanket frame element due to the vacuum between said blanket element and glass brings the materials to be printed into snug contact engagement with each other for best possible exposure or printing, all in a conventional manner.

Having described our invention, reference should now be had to the following claims.

We claim:

1. In a printing plate maker having a body, a blanket frame horizontally disposed upon said body and pivoted thereon for tilting to an upright position, and a glass frame positioned over the blanket frame in sealing registry therewith and hingedly connected thereto for relative opening movements when horizontal and for tilting movements therewith into an upright printing position;

a framework connected to said body and extending rearwardly thereof;

a pair of parallel spaced opposed channel tracks upon said framework and extending substantially its length;

an inverted U-shaped housing spanning said framework;

rollers upon the sides of said housing at its lower edges and guidably mounted in said channel tracks for reciprocal movements thereon;

a high intensity light support frame overlying said framework and at its forward end projecting into said housing;

rollers at the rear sides of the light support frame nested and supported within said channel tracks;

opposed inwardly directed channel tracks upon the inner surface of the housing side walls;

rollers at the front sides of the light support frame nested and movably supported within said housing channel tracks;

said housing adapted for reciprocal movements upon said framework and for registry with said glass frame when tilted upright;

said light support frame being adapted for reciprocal movements upon the framework and for relative movement within and with respect to said housing for selectively controlling the center distance between the glass frame and a light source mounted upon said light support frame.

2. In the printing plate maker of claim **1,** opposed upright outwardly directed channels upon the front outer sides of said housing; and links pivotally mounted at their one ends upon said blanket frame and at their other ends, mounting rollers positioned within said upright channels whereby, when the blanket frame is horizontal, the housing is spaced rearwardly of said body, and when said blanket frame is upright, said housing is moved into registry with the upright glass frame.

3. In the printing plate maker of claim **1,** a control rod at one end secured to said light support frame and at its other end, having a handle for manually moving the light support frame relative to said glass frame and to said housing; a pointer on said handle; and a longitudinally extending scale upon the printing plate maker for registry with said pointer.

4. In the printing plate maker of claim **3,** said rod extending forwardly into said body and guidably mounted thereon; a scale underlying said rod and its handle facilitating longitudinal adjustment of the light support frame when the blanket frame is upright.

5. In the printing plate maker of claim **1,** an upward transverse centrally apertured bellows plate mounted upon the forward end of said light support frame, a high intensity light source mounted upon the light support frame; and a reflector hood upon and extending forwardly of said light source mounted upon said bellows plate in snug registry with its aperture.

6. In the printing plate maker of claim **5,** an angle iron mounted upon said bellows plate along the sides and bottom of said aperture and extending rearwardly thereof to laterally enclose and supportably receive said reflector hood.

7. In the printing plate maker of claim **5,** the mounting of said light source including an upright frame adjustably receiving said light source and hood; said frame mounted upon the light support frame and pivotally connected thereto.

8. In the printing plate maker of claim **5,** the mounting of said light source including an upright frame adjustably receiving said light source and hood, said frame mounted upon the light support frame and pivotally connected thereto; an angle iron mounted upon said bellows plate along the sides and bottom of said aperture and extending rearwardly thereof to laterally enclose and supportably receive said reflector hood; whereby said light source and hood and its frame may be tilted rearwardly out of registry with said bellows plate.

9. In the printing plate maker of claim **1,** a high intensity light source mounted upon said light support frame and mounting a reflector hood for projecting light into said housing towards said glass frame; an electrical circuit including power means and a timer for activating the light source and controlling its duration; a normally open safety limit switch in said circuit positioned in said body; and a pin on the blanket frame registerable with said limit switch when said blanket and glass frames are upright to complete the electrical circuit to the light source; any forward movement of the glass and blanket frames deactivating said light source.

10. In the printing plate maker of claim **5,** the mounting of said light source including an upright frame adjustably receiving said light source and hood, said frame mounted upon the light support frame and pivotally connected thereto; and detent means on said light support frame normally holding the light frame in upright position.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,771,869 Dated November 13, 1973

Inventor(s) Robert J. Diehl, et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover sheet, in the heading, item [75] Inventors should read as follows:

Robert J. Diehl, Grosse Point Park; Robert Maher, Farmington; William Amolsch, Detroit; Agusto Uytuico, Royal Oak, all of Michigan --.

Signed and sealed this 14th day of May 1974.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334.

UNITED STATES PATENT OFFICE

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Signed and sealed this 14th day of May 1974.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

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