Jan. 12, 1932. E. S. BALLARD 1,841,274

PREPARATION OF PHOTOGRAVURE COPY AND THE LIKE

Original Filed Nov. 9, 1926 2 Sheets-Sheet 1

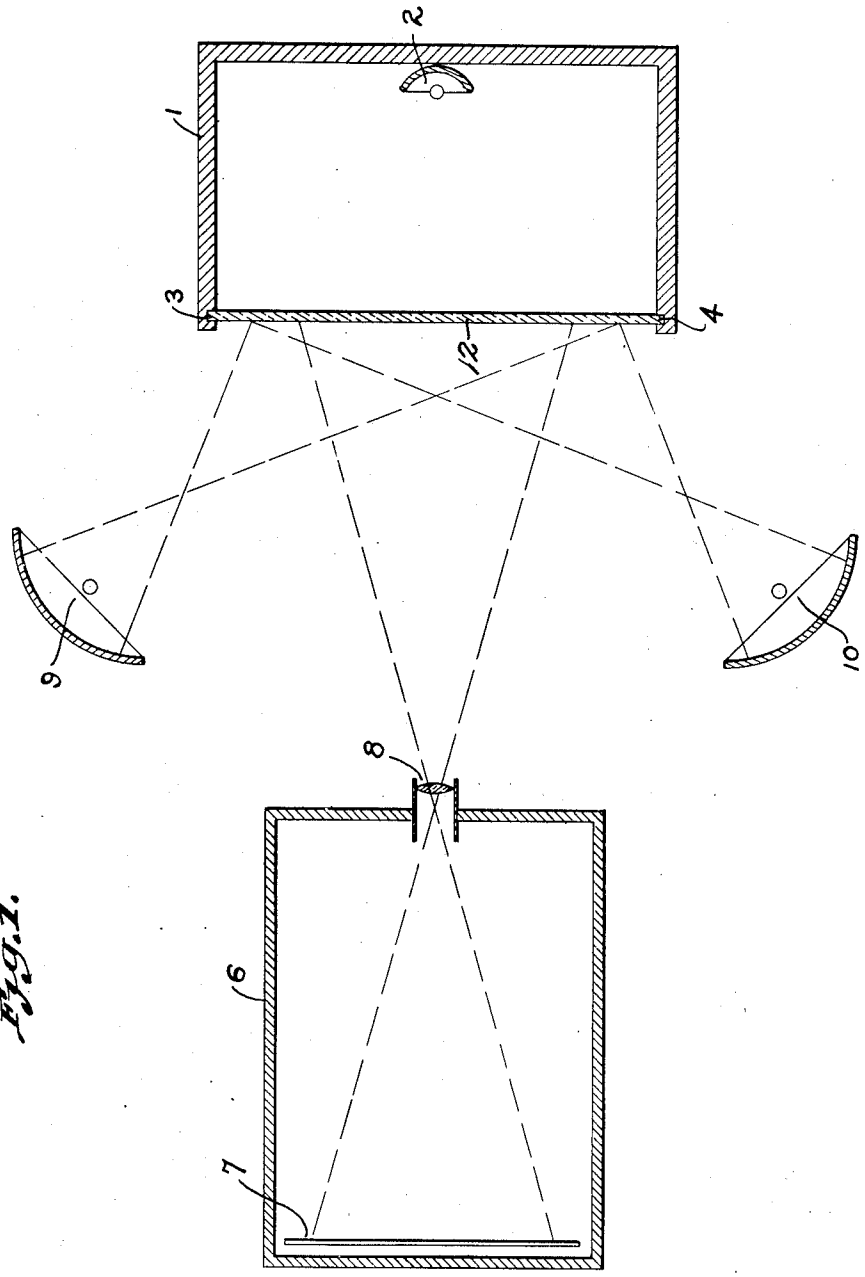

Fig. 1.

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Fig. 2.

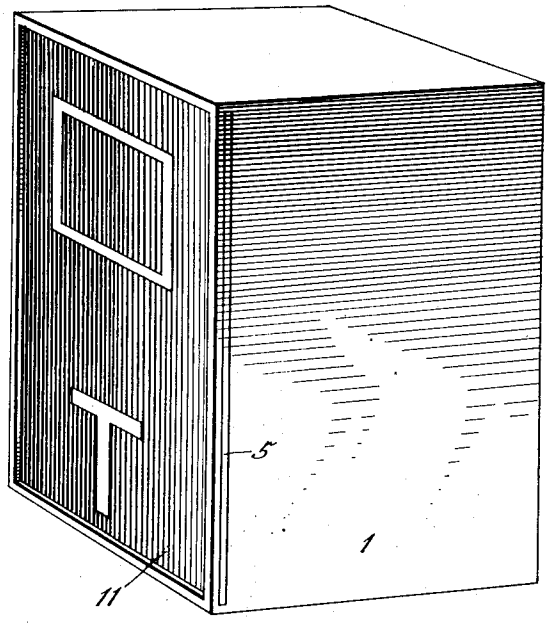
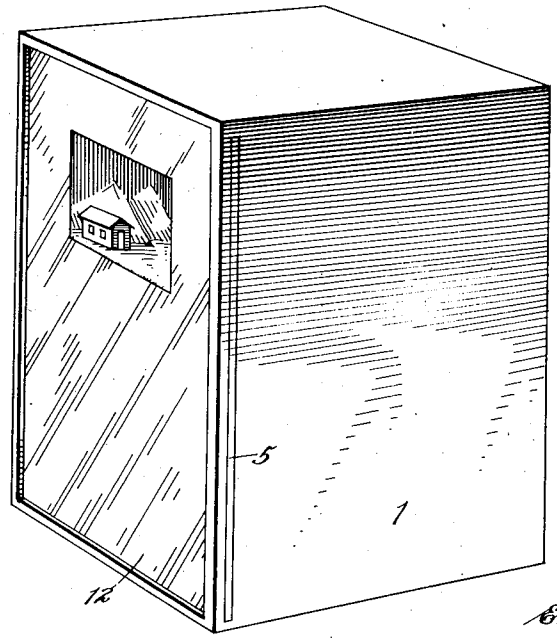


Fig. 3.



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PREPARATION OF PHOTOGRAVURE COPY AND THE LIKE

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This invention relates to the preparation of copy for photogravure and like purposes. It applies to the so-called "rotogravure" or rotary-photogravure fields, and when the term "photogravure" is used herein, it is intended to apply to all related uses. The term "copy" is intended to apply to both negative and positive plates or films, which directly or indirectly result in the final plates employed to print the desired matter. Such printed matter usually consists of a photograph accompanied by a decorative effect and certain type matter.

The object of this invention is to produce a photogravure negative or positive copy, particularly the latter, whereby localized control of tone values, opacity, and transparency in any desired area, restricted or otherwise, is fully at the option and control of the operator, eliminating at the same time painting out, patching, stripping in, or blocking out.

In the present stage of the art, positives are commonly made by exposing a sensitized plate in a camera to light rays projected through a negative placed at the proper distance in front of the lens of the camera, and between the lens and the source of illumination, which is frequently a piece of white paper covering the copy board of the camera and illuminated by arc lamps placed on each side of said camera. Where this method is employed it is necessary, in order to secure transparent borders or other areas on the positive, to render corresponding portions of the negative opaque by "painting out" with opaque materials. Any type matter or text that is to accompany the positive must be made separately, either by photographing on a separate plate, or by imprinting upon celluloid or other transparent material. Said type matter and picture positives are subsequently assembled upon one plate of glass in what is commonly known as a "makeup" operation. Cementing, stripping in, patching and adjusting of said type matter and pictures, are necessary in order to make a properly assembled and correctly registered grouping of type matter, art work, and pictures for the "printing down" upon the carbon tissue or sensitive gelatine which is subsequently transferred to the copper surface for the etching operation.

My new and improved method, together with mechanism for its operation, as described herein, not only provides a means of placing all type matter, pictures, and art work upon a single sensitized plate by a photographic operation, but also enables the operator to exercise complete control over the transparency or density of any portion of said plate in the operation of producing the single positive that is to consist of type matter, art work, and photographic positives.

Thus by my process and mechanism the type matter may be maintained at one degree of density, the surrounding areas may be kept absolutely transparent, and adjoining or intermingled pictures may have an entirely different degree of opacity and "tone", all at the option of the operator and as desired by him; all of which is made possible without laborious painting, patching, stripping in, or blocking out.

It will be appreciated that with such control it is possible for the operator to make the density of the type matter no greater than the density of the deepest shadows of the pictures. As a result, in the final printing-down on the carbon tissue the depth of gelatine representing the type matter will be the same as that representing the shadows of the pictures; and as a consequence, type matter and pictures may be etched in one operation.

My method of procedure, and the apparatus employed, will be the better understood by reference to the accompanying drawings, in which

Fig. 1 shows a vertical central sectional view of a form of apparatus suitable for practicing my method;

Fig. 2 shows a perspective view of the box or holder for the glass plate which carries the copy, the plate in this instance being one suitable for carrying type matter;

Fig. 3 shows a similar view of the box with a glass plate in the front thereof, fitted with photographic matter.

Referring to the drawings, 1 is a box, painted black on the inside, or otherwise

lined with light-absorbing material. A source of illumination under control of the operator is provided at 2. The box is grooved at 3 and 4 to receive a sheet of glass, which can be slipped into place or readily removed through a slot 5, being so designed that when thrust into place it abuts against the bottom side of the box, thereby always taking the same position, or "registering."

At 6 is a photographic camera, carrying a sensitive plate or film 7. The camera lens is indicated at 8.

The operation is as follows:

Art work and type matter are inscribed or printed upon translucent paper, suitable space being left for the photographic pictures. From this translucent paper a negative is made, either by contact printing or in a camera, or by any one of numerous ways in which such a negative can be produced. This negative is thereupon mounted upon a sheet of glass 11 (Fig. 2) that will slide into the grooves 3 and 4 of box 1 and register as heretofore described.

With the negative in place and camera 6 properly in focus, lens 8 being uncovered, the operator makes an exposure of type matter and art work upon the sensitized plate 7, by causing light to be produced at the source of illumination, 2. Density of the impression upon the sensitive plate 7 will depend upon the duration of the illumination at 2, which is back of the negative and projects its rays through the same. Those areas on the sensitive plate surrounding the type-matter and art work will be unaffected.

Following this exposure, the operator covers the lens 8, removes the negative and glass from the front of the box, and proceeds with the second operation, viz., the photographing of the pictures upon the sensitive plate 7, said pictures to occupy spaces reserved for them in the layout, and to register properly with the type matter and art work already photographed by the operation just described.

As the first step in this secondary operation, photographic negatives are made upon sensitive paper, either by contact printing, or in a camera, proceeding by the usual copying methods extensively practiced over a period of many years.

Upon a piece of red glass 12 (Fig. 3) or similar transparent material of non-actinic tint or color, a dummy layout is sketched in chalk or other readily removed substance, and the paper negatives are placed on the glass on the spaces reserved for the pictures. Having stripped these pictures into position, all chalk and other foreign materials are removed from the surrounding non-actinic colored glass. In place of the sheet of glass colored or tinted a non-actinic color or tint, I may employ a sheet of glass backed with dull black material that absorbs but will not reflect light.

Said glass is now slipped into the grooved box in the position formerly occupied by the first glass and negative. The illumination is now furnished from sources 9 and 10, located at the sides and forward of the box 1. The operator makes an exposure upon the sensitized plate 7 by means of the reflected actinic rays that come from the surface of the paper negatives. The rays that strike the surrounding colored glass supporting surface either pass completely through into the black box and are absorbed, or such rays as are reflected back into the camera 6 come back as non-actinic rays and have no effect upon the sensitive plate.

Thus, only those areas corresponding to the pictures or paper negatives are affected, and impressed in a photographic manner. All surrounding areas, which may contain more or less type matter and art work as photographed by the first operation, remain unchanged. In the second operation the density of the pictures is at the will of the operator, and depends upon the amount of light that is reflected from the paper negatives, and the extent of the exposure.

It will be appreciated that these two operations, as heretofore described, are interdependent, and provide a means of making an exposure upon certain sections of a sensitized plate, reserving other sections for a subsequent operation. Said reserved section is unaffected by the first operation; and, in a like manner, the first portions utilized remain unaffected by the second operation, all of which is accomplished without painting-out, employment of masks, or other common, slow, and unsatisfactory processes.

If it is desired to secure negatives rather than positives in the camera, with deeply opaque ground surrounding the objects photographed, the procedure is as follows: The pictures or objects to be photographed are mounted upon a transparent or translucent sheet of glass, and placed in the groove of the dark box 1. While the objects to be photographed are illuminated from the front by the lamps 9 and 10, they are at the same time illuminated from behind by the source of light 2. Thus the preponderance of illumination coming from behind the objects to be photographed can be made greatly in excess of that reflected from the surfaces confronting the lens of the copying camera. The result will be a deeply opaque ground with the photographic density of the objects themselves controlled by the duration and intensity of the illumination from lamps 9 and 10.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A method of preparing copy for the purpose mentioned, which consists of reflecting

from photographs or images actinic light, and causing the background or mounting upon which such photographs or images are mounted to absorb the greater part of the illumination directed at them, so as to reflect only non-actinic light.

2. A method of making positives, negatives, or transparencies for the photogravure or rotary photogravure process, consisting of photographing type matter and art work upon a sensitized plate without affecting adjacent areas, and subsequently, by a second operation, photographing pictures upon said adjacent areas to any desired degree of density, tone gradation, and opacity, without affecting the areas exposed in a photographic manner by the first operation.

3. A method of combining upon a sensitized plate pictures, type matter, and art work, as employed in the rotary photogravure process, which consists of exposing certain areas on the plate for type matter and art work, and reserving upon said plate, in proper register, areas upon which pictures may be photographed by a subsequent operation, without encroaching photographically or mechanically upon the areas occupied by the type matter and art work.

4. A method of combining upon a sensitive plate pictures, type matter, and art work, as employed in the rotary photogravure process, which consists of exposing certain areas on the plate for type matter and art work, and using certain prescribed areas for such photography, without encroaching mechanically or photographically upon other areas reserved for pictures to be impressed upon such plate by photographic means.

5. In the preparation of photogravure or rotogravure copy, a method which consists of combining upon one plate or film photographed type matter and art work of any desired degree of density, surrounding said type matter and art work by fully transparent areas, photographing pictures upon other prescribed areas by a separate photographic operation, separate from the first operation, and controlling the density of said pictures independently of the density of the type matter and art work.

6. In the preparation of photogravure copy, a method consisting of preparing a negative of the decorations and type matter desired, placing this negative on a transparent plate in register with a camera, illuminating the same from behind, exposing a sensitized plate to the negative, removing the negative and introducing in the same registered position a negative of an object to accompany said decorations and type matter, arranging said object upon a screen of non-actinic value and in register with said decorations and type matter, and illuminating said non-actinic screen from in front.

7. In the preparation of photogravure or rotogravure copy, the method which consists of exposing type matter and art work upon a sensitized plate for photographing, and subsequently registering a picture upon the same plate to conform to a predetermined lay-out between the picture and the type matter and art work.

8. In the preparation of photogravure copy, a method which consists in mounting an opaque picture or object having a reflective surface on a transparent background disposed in front of a light absorbing means and photographing said picture or object and said background under the action of light projected from a source or sources located so that most of the light passing through said transparent background is absorbed and so that substantially all of the remainder reflected from said background is non-actinic light.

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