

May 10, 1932.

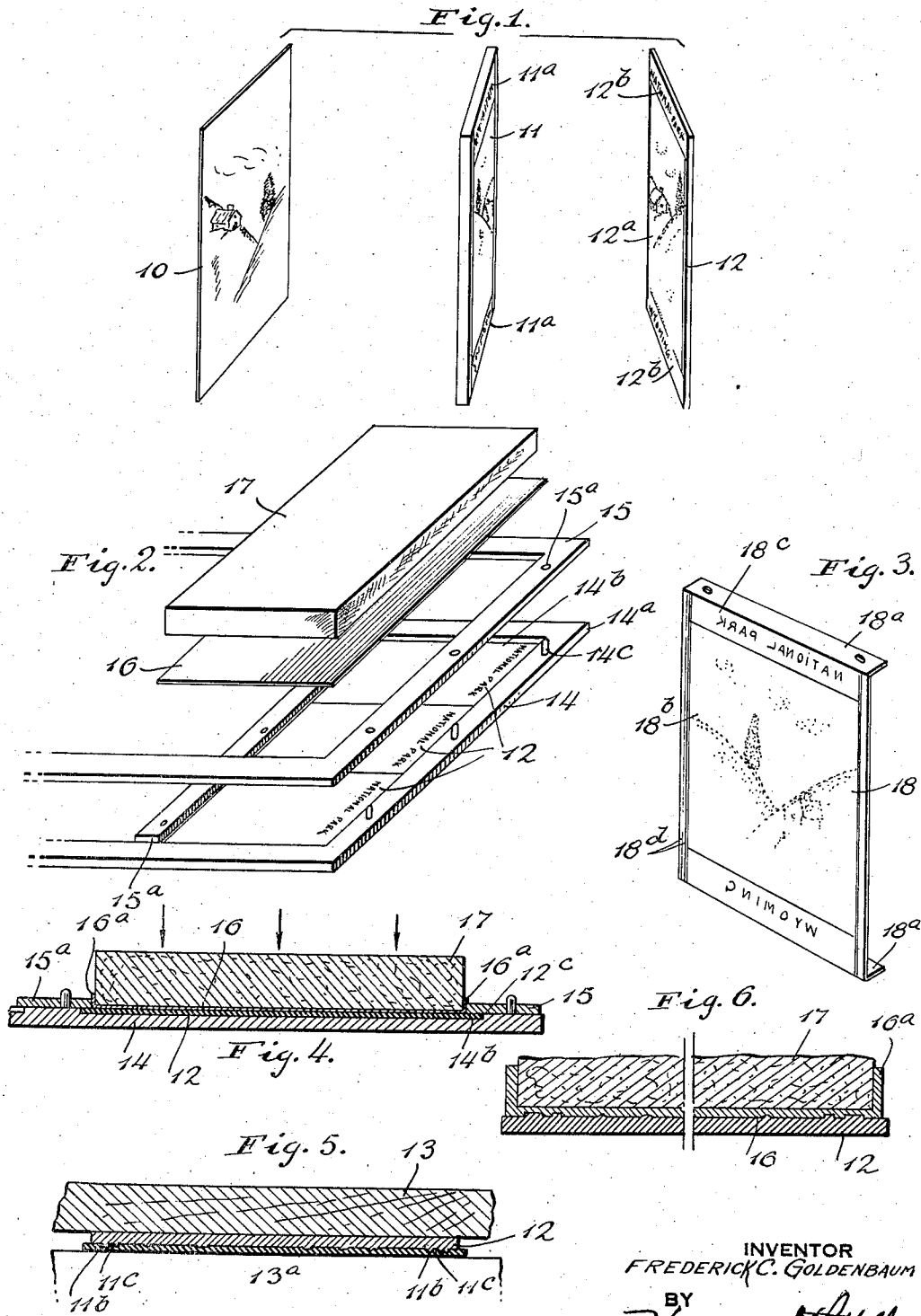
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1,857,842

METHOD OF PRODUCING PRINTING PLATES

Filed April 19, 1929

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 7.

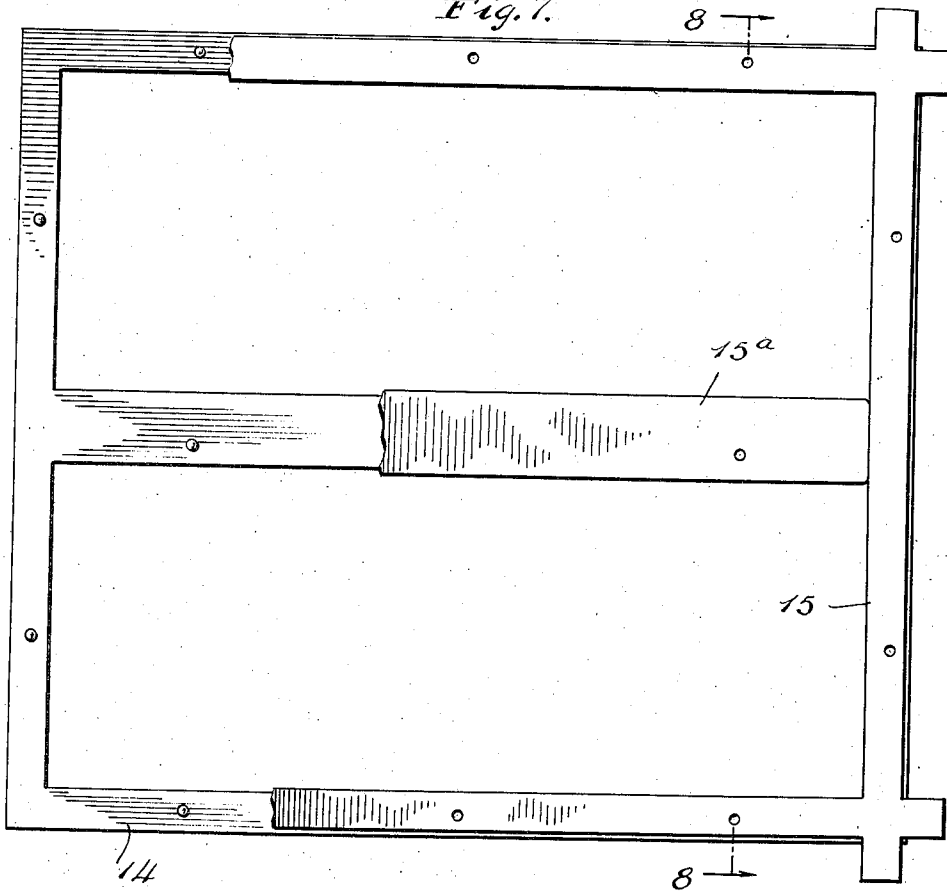


Fig. 8.

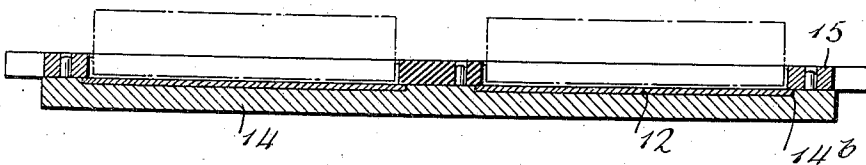
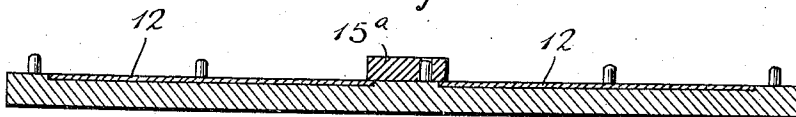


Fig. 9.



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METHOD OF PRODUCING PRINTING PLATES

Application filed April 19, 1929. Serial No. 356,546.

This invention relates to improvements in flexible non-metallic printing plates and to the process and apparatus for producing the same.

It is an object of the invention to provide practical and commercial methods of reproducing in a flexible non-metallic printing plate a printing surface for news printing of photographs and the like, preserving the high lights and shadows now obtained by the use of electrotypes, copper engravings or zinc etchings in the reproduction of photographs, advertising matter etc.

Another object of the invention is to provide a multiplicity of said flexible printing plates from a single original copper engraving or zinc etching so as to reduce the cost of news photographs, advertising material, etc., and facilitate the reproduction thereof by the printer.

Another object of the invention is to provide a method of producing flexible printing plates capable of printing half-tone photographs etc. on which the photograph or advertising material is provided and which is at the same time provided with integral clear type caption and descriptive printing relating to said photograph or advertising material.

Another object of the invention is to provide an apparatus and method whereby said flexible printing plates are provided in the process of manufacture with integral turned flanges to facilitate the securing of the same upon the printing block.

Another object of the invention is to provide a method of producing flexible printing plates of the type described in which the lines in the copper engraving or zinc etching may be reproduced in a lead mold positive under pressure without producing variations in thickness and imperfections in the lead mold.

Another object of the invention is to provide the publishers and printers in outlying cities with flexible non-metallic plates for printing photographs and the like at a lower cost than they can secure electrotypes for this purpose.

Other objects and advantages of the invention will appear as the description proceeds.

Referring to the drawings which illustrate preferred embodiments of the invention:

Figure 1 is an iso-symmetric view illustrating the original photograph to be reproduced, the electrotypes constituting the master cut and the lead mold used, showing the steps in the production of flexible printing plates;

Figure 2 is an expanded view of the molding frame and printing material used in producing the printing plate;

Figure 3 is a perspective view of the final printing plate;

Figure 4 is a sectional view of the lead mold and printing plate in the pressure frame;

Figure 5 is a sectional view showing the step of producing the lead mold from the copper engraving or zinc etching;

Figure 6 is an enlarged sectional view showing the production of a printing plate from the lead mold;

Figure 7 is a plan view of the multiple frame used in the production of printing plates from the lead molds;

Figure 8 is a sectional view on the line 8—8 of Figure 7 showing the lead mold, printing plate and pressure block in position in the frame; and

Figure 9 is a sectional view of the lower portion of the frame with part of the upper section removed.

In supplying a news photographic service, advertising material, etc., particularly to country newspapers, considerable difficulty has been heretofore experienced in the fact that newspapers, particularly in outlying sections, are often handicapped in securing electrotypes for printing the news photographed or advertising material to be reproduced and the cost of the electrotypes, plus the cost of the photograph or news service, often places this service at such a high figure as to be prohibited to the papers of limited circulation.

I am, by my invention, enabled to supply to newspapers in outlying districts a news photograph or advertising service providing them with printing plates of thin flexible material carrying the half-tone imprint of the photograph or the like and adapted to be

secured upon a suitable printing block and used directly in printing the newspaper, so as to permit them to use news photograph service at a very small cost and without the inconvenience and expense of producing their own electrotypes from each photograph which they may desire to use. By my process I am furthermore able to reproduce, from a single original copper engraving or zinc etching, a plurality of these thin flexible printing plates which can be mailed to the various subscribing newspapers in the news photograph service at a cost only slightly greater than the cost of supplying the photograph itself and much lower than the cost of mailing electrotypes or stereotype plates or copper engravings.

According to my invention, a photograph 10 of any suitable subject matter is first prepared by the photographer or artist. A copper engraving or zinc plate 11 is then prepared from this photograph carrying, in addition to the photographic subject matter, a suitable descriptive caption or descriptive printing 11a to describe the subject matter of the photograph, the said descriptive printing 11a being reproduced on a clear background independent of the stippled half-tone or screen background on which the photograph is reproduced on the copper engraving or zinc plate. The copper engraving or zinc plate produced in this way is then used as the matrix for the production of a plurality of lead mold matrixes 12 carrying an imprint of the photograph 12a and an imprint of the type or caption material 12b. Any number of lead molds 12 can be produced from the original copper engraving or zinc plate 11 by placing a sheet of lead of a suitable thickness, say .070 inches, over the copper engraving or zinc plate and subjecting this to a pressure of from 5 to 15 tons per square inch to press the lead into the face of the copper engraving or zinc plate and reproduce on the lead mold the high lights, shadows and printing which appears on the original copper engraving or zinc plate. Inasmuch as the lead used for this purpose must be comparatively soft and free flowing under pressure and the pressure used is sufficient to cause the lead to flow into and take the imprint of all the fine lines and interstices in the copper engraving or zinc plate, suitable means must be provided to prevent the lead from being squeezed out at the sides of the copper engraving or zinc plate. For this purpose, the copper engraving or zinc plate 11 shown with the lead 12 in position thereon in Figure 5 is provided along the outer margins of the photograph or other matter to be produced with ridges 11b and depressions 11c around the margin thereof acting as dams into which the lead of the mold is pressed by the pressure of the press to prevent the lead from being squeezed out sideways along the edges of the copper en-

graving or zinc plate which would cause the lead plate to be thinner at the edges than at the center, producing an imperfect printing surface. The lead molds 12 produced by the pressure of the platen 13 upon the bed 13a of the press forcing the soft lead to flow into and receive the impression from the copper engraving or zinc plate 11 are placed in a suitable molding frame 14, consisting of a base 14a having a depression 14b for receiving a plurality of the lead molds 12 therein having a surrounding frame portion 15 provided with removable separation bars 15a adapted by means of dowl pins 14c and openings 15a to be held in registry with each other. The lead molds 12 are assembled in the frame 14 and the edges of the frame 15 and 15a overlap the edges 12c of the mold to retain the molds in position in the frame, and for the production of the printing plate, a sheet of suitable plastic, moldable material 16, such as fiberloid, (produced from a mixture of paper, camphor and alcohol), celluloid, or the like, is placed upon the frame over the lead molds 12 and after being heated to a softening temperature of from 225° to 250° F., on a suitable steam table or other heating device, the sheet 16 is covered by a resilient pressure member of felt or the like 17 and placed under a platen of a hydraulic or other press where a pressure of 25 to 100 pounds (varying with the high lights of the photograph and the thickness of the sheet 16) is placed upon the sheet 16 to cause it to take the impression of the lead molds 12. The sheet 16 is preferably of slightly greater width than the width of the opening in the frame 15 so that when the pressure member 17, which is of slightly smaller size than the opening in the frame 15, is pushed into this opening, right angle flanges 16a are turned up along two edges of the sheet 16 to provide a final printing plate 18 having integral flanges 18a by which it may be secured on a printing block and carrying on its face a negative half-tone photograph 18b, the printing or caption material 18c reproduced on a clear background, and the marginal raised and depressed border flanges 18d caused by the lead flowing into the ridges and depressions 11b and 11c to provide a suitable margin or border for the picture. In many instances it is preferable to subject the lead molds 12, after having been pressed into the face of the copper engraving or zinc plate, to a planing operation to smooth the back thereof and assure uniform thickness throughout, so as to prevent any lack of uniformity in the final printing plate which would cause improper printing when inserted in the presses. The depressions 14b in the frame 14 are of substantially the exact dimensions of the lead molds and correspond in depth to the thickness of the lead, so that the molds 12 are confined on all edges by the depressions 14b and the over-

hanging of the frame 15, so that the pressure of the member 17 will not cause any flow of the lead in the molds 12 when under the molding press.

As illustrated particularly in Figures 7, 8 and 9, the frame 14, used in producing the printing plates from the lead molds, is provided with a bordering frame member 15 with separate division strips 15a and the face of the frame 14 is provided with depressions 14b approximately the thickness of the lead molds and of a size to receive lead molds carrying the portion of the picture to be reproduced. These depressed portions 14b are overhung by the frame 15 and the division strips 15a in a manner to hold lead molds in position in the frame during reasonable moving of the frame to and from the steam table for heating the flexible sheet 16 or to and from the press for pressing the sheet 16 in the face of the lead molds and so as to confine the lead of the molds 12 from spreading under the pressure of the molding press. The molding press is preferably water-cooled to quickly lower the temperature of the sheet 16 and the temperature of the molds and sheet is reduced to about 100 to 150° F. under the press producing a hard surfaced flexible printing plate, capable of withstanding the wear and pressure of several thousands of printings. As shown, for example, in Figure 9, the outer frame 15 may be removed from the frame 14, leaving the longitudinal division strips 15a in position therein, so as to permit the lead molds 12 to be inserted under the edge of the strips 15a or the molds to be removed therefrom, the strips 15a serving temporarily to hold the lead molds in place while the frame 15 is inserted thereover.

While the process has been described with reference specifically to the reproduction of news photographs on flexible non-metallic printing plates, it will be understood that the same may be used to produce any type of printing material and to prepare from a single copper engraving or zinc etching or other set-up a plurality of flexible printing plates. I, therefore, desire that my invention be construed in a broad light in accordance with the terms of the appended claims.

What I claim as my invention is:

1. The method of preparing a flexible non-metallic photographic printing plate which comprises producing a half-tone copper engraving patrix from a photograph, providing the copper engraving with a clear line printing caption outside the half-tone portion, preparing a lead mold matrix from the copper engraving carrying the half-tone photograph and clear line printing material, molding the flexible non-metallic printing plate from the lead mold by heat and pressure and forming integral turned flanges on the printing plate during the molding process.

2. The method of preparing a flexible non-metallic photographic printing plate which comprises producing a half-tone copper engraving from a photograph, providing the copper engraving patrix with a clear line printing caption and description outside the half-tone portion and with ridges and depressions on the outer edges, preparing a lead mold matrix from said copper engraving by pressing the lead into the copper engraving and utilizing the ridges and depressions on the edges of the copper engraving to prevent side-wise flow of the lead under pressure and molding the flexible non-metallic printing plate from the lead mold by heat and pressure utilizing the ridges and depressions of the copper engraving as a border for the photograph.

3. The method of preparing a flexible non-metallic photographic printing plate which comprises producing a half-tone copper engraving from a photograph, providing the copper engraving patrix with a clear line printing caption and description outside the half-tone portion and with ridges and depressions on the outer edges, preparing a lead mold matrix from said copper engraving by pressing the lead into the copper engraving and utilizing the ridges and depressions on the edges of the copper engraving to prevent side-wise flow of the lead under pressure and molding the flexible non-metallic printing plate from the lead mold by heat and pressure utilizing the ridges and depressions of the copper engraving as a border for the photograph and forming integral in-turned flanges on the printing plate during the molding process.

4. The method of preparing a flexible non-metallic photographic printing plate which comprises producing a half-tone copper engraving patrix from a photograph, providing the copper engraving with a clear line printing caption and description outside the half-tone portion and with ridges and depressions on the outer edges, preparing a lead mold matrix from said copper engraving by pressing the lead into the copper engraving and utilizing the ridges and depressions on the edges of the copper engraving to prevent side-wise flow of the lead under pressure and molding the flexible non-metallic printing plate from the lead mold by heat and pressure and confining the edges of the lead mold from spreading during the printing plate molding operation utilizing the ridges and depressions of the copper engraving as a border for the photograph.

5. The method of preparing flanged non-metallic photographic printing plates, which comprises preparing a copper engraving patrix from the photograph, providing said patrix with a clear line caption and descriptive printing outside the half-tone portion, preparing lead mold matrixes from said cop-

per engraving, mounting the lead molds in a frame, heating the lead molds and printing plate material and pressing the printing plate material into the frame and against the lead mold to produce a non-metallic flanged plate carrying the imprint of the lead mold matrixes.

6. The method of preparing flexible flanged printing plates from sheet material moldable under heat and pressure, which comprises mounting the matrix for said plates in a printing frame, heating the matrix and frame and the plate material, and pressing a sheet of the plate material of larger dimension than said frame into the frame and against the matrix to receive the imprint of the matrix and produce integral turned flanges on the sheet.

In testimony whereof I have affixed my signature to this specification.

FREDERICK C. GOLDENBAUM.