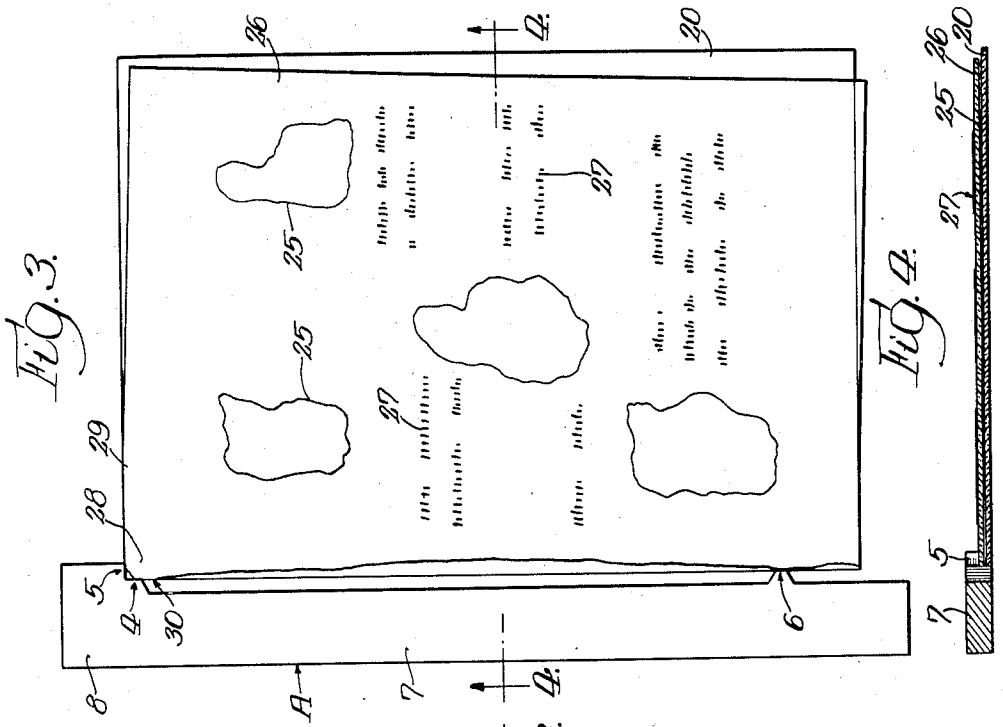
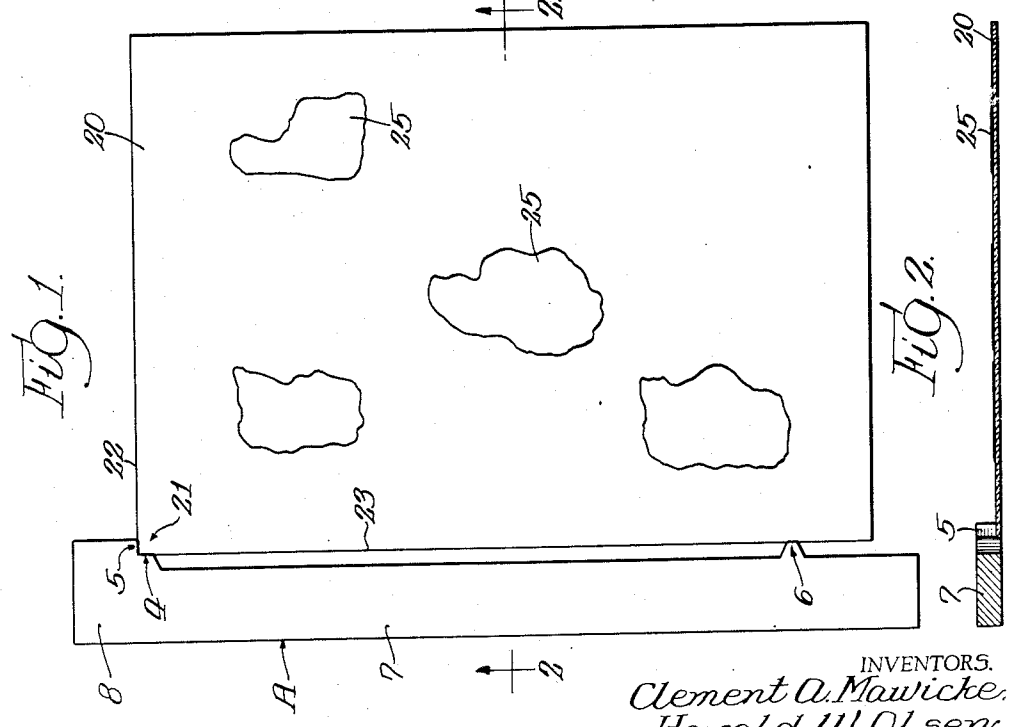
Aug. 31, 1943. C. A. MAWICKE ET AL 2,328,480

REGISTER RAIL FOR DOUBLE PRINTING

Filed March 9, 1942 4 Sheets-Sheet 1





INVENTORS.
Clement A. Mawicke.
Harold W. Olsen.
By Thiess, Olson & Mecklenburger Atty's.

Aug. 31, 1943. C. A. MAWICKE ET AL 2,328,480

REGISTER RAIL FOR DOUBLE PRINTING

Filed March 9, 1942 4 Sheets-Sheet 2

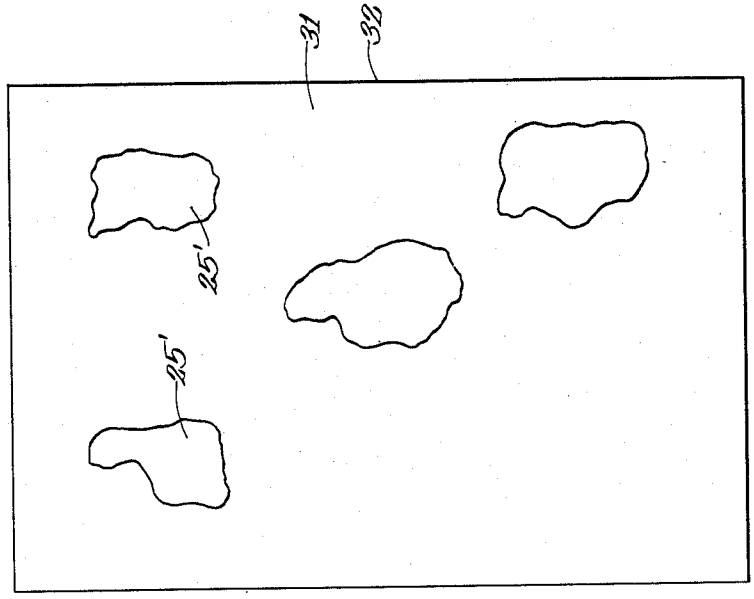


Fig. 7.

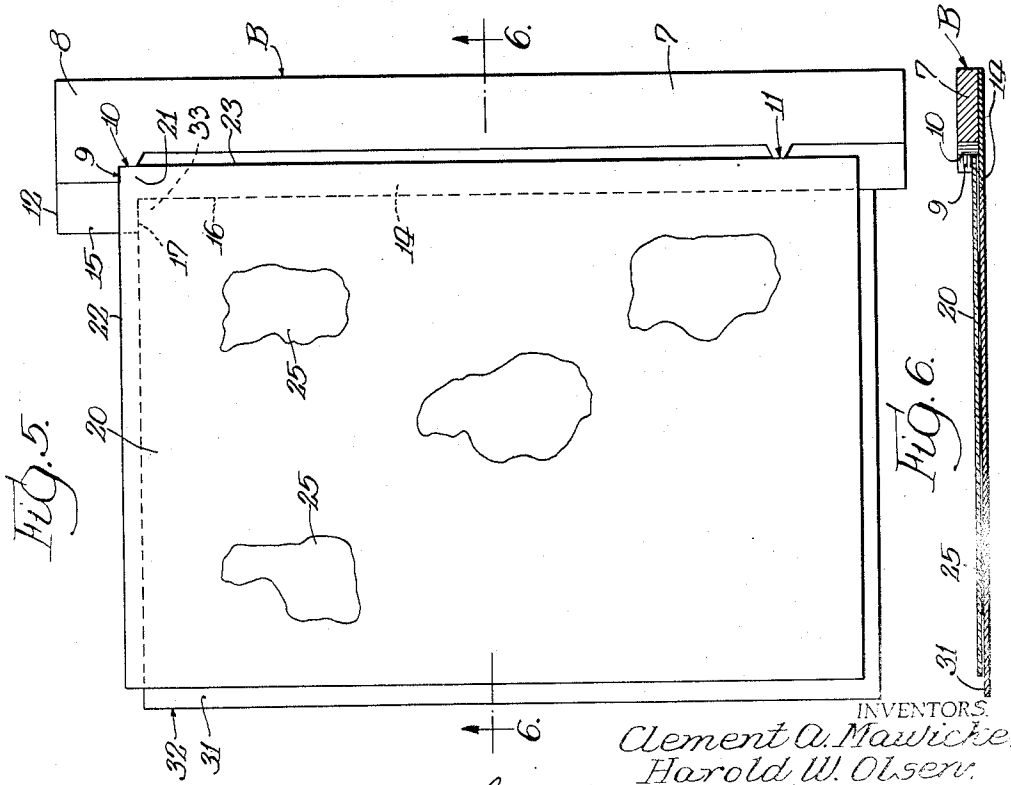


Fig. 5.

Fig. 6.

INVENTORS.
Clement A. Mawicke;
Harold W. Olsen.
By Thiess, Olsen & Mueller Attys

Aug. 31, 1943. C. A. MAWICKE ET AL 2,328,480

REGISTER RAIL FOR DOUBLE PRINTING

Filed March 9, 1942 4 Sheets-Sheet 3

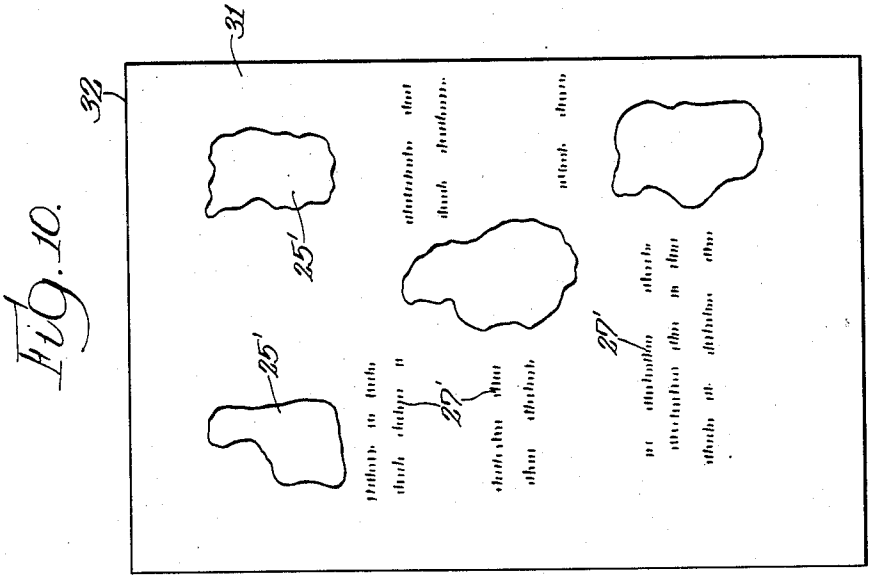


Fig. 10.

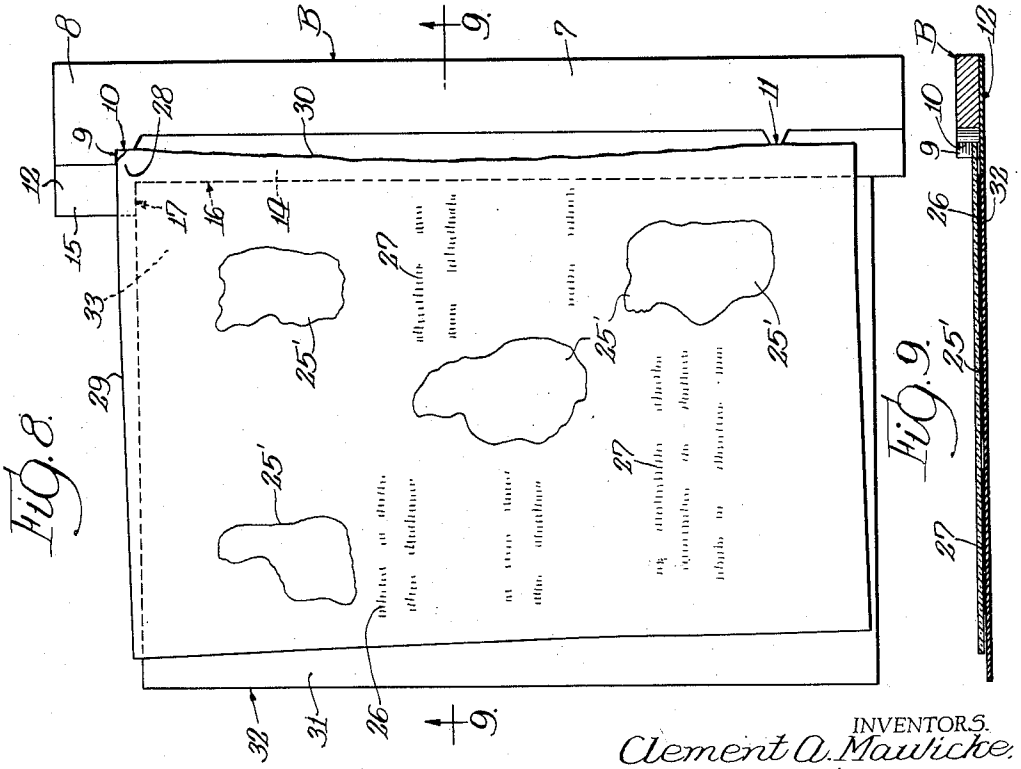


Fig. 8.

Fig. 9.

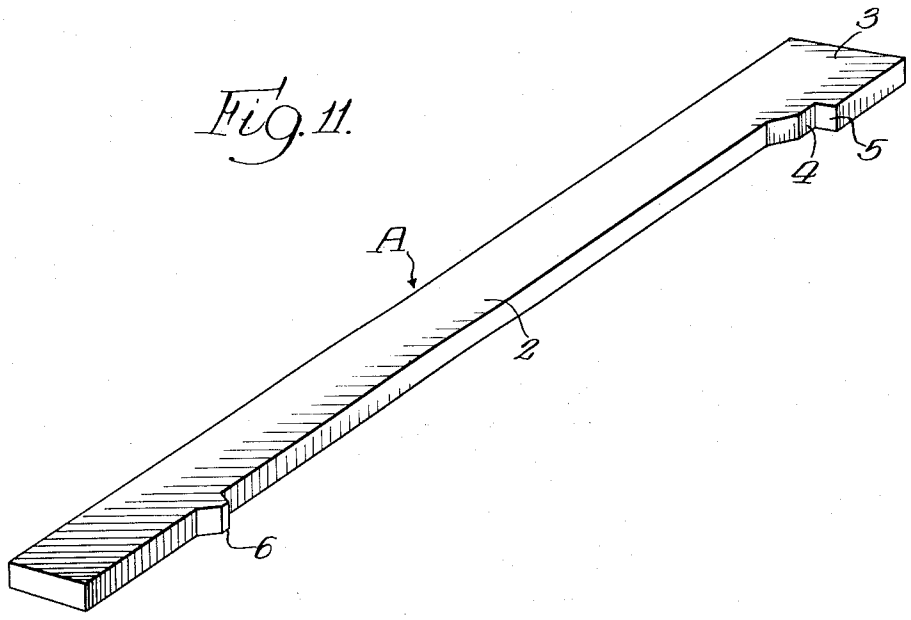
INVENTORS.
Clement A. Mawicke.
Harold W. Olsen.
By Thiess, Olson & Mechlenburger Attys.

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REGISTER RAIL FOR DOUBLE PRINTING

Filed March 9, 1942 4 Sheets-Sheet 4

Fig. 11.



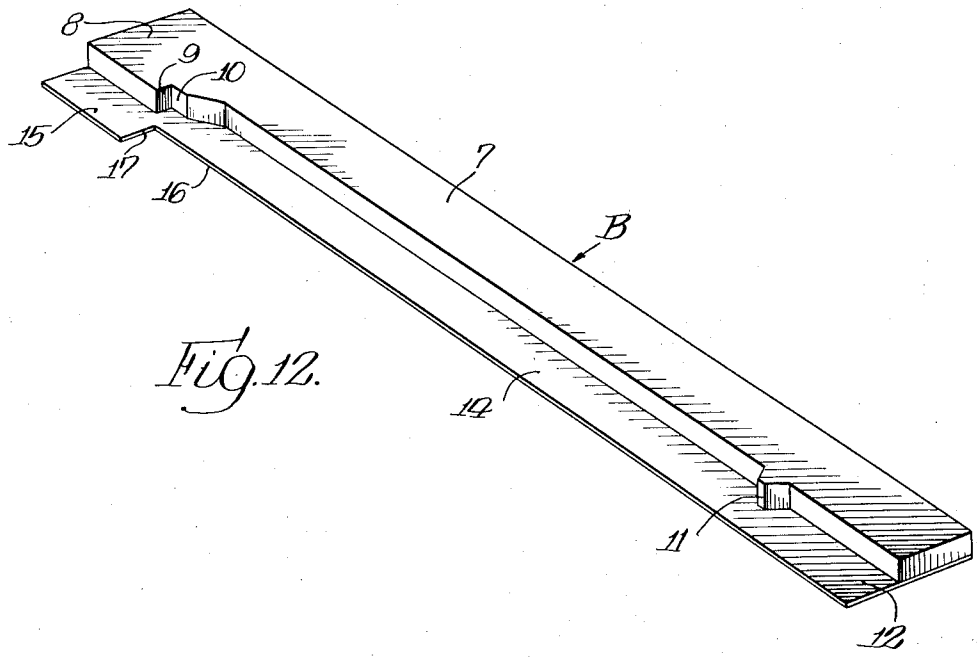


Fig. 12.

INVENTORS.
Clement A. Mawicke,
Harold W. Olsen.
By Thiers, Otis & Luedeka Inge Atty's.

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UNITED STATES PATENT OFFICE

2,328,480

REGISTER RAIL FOR DOUBLE PRINTING

Clement A. Mawicke, Wilmette, and Harold W. Olsen, Chicago, Ill.; said Olsen assignor to said Mawicke

Application March 9, 1942, Serial No. 433,910

9 Claims. (Cl. 95—5)

This invention relates to the art of multi or double printing and its purpose is to provide improved apparatus that not only maintains a predetermined relation between a number of negative plates during their make-up operations but assures reproducing the identical positioning of these plates upon the surface of a sensitized metal plate on which the images carried by these negative plates are to be photographically reproduced during successive exposures thereof, the invention being directed to accomplishing the result herein disclosed automatically so to speak and thereby eliminate the judgment of the operator in determining such positioning or registration.

The invention, while described and illustrated in connection with multiple or double printing in photoengraving, is not necessarily limited to such use solely but may be used wherever the apparatus finds suitable application, whether it be in multiple or double printing or elsewhere in the photographic art.

In the art of double printing in photoengraving, the various negative images are first gathered by the stripping operator and are laid upon glass plates in predetermined positions according to a given layout. It the case of combined half tones and line images, as would be found in illustrative advertisements, the stripping operator first strips the half tone images and lays them upon a glass plate. The line images are then stripped and arranged upon a second glass plate placed over the glass plate upon which the half tone images have been arranged. In this work, the operator is required to follow a predetermined pattern provided by the copy and place the line images in predetermined positions upon the second glass plate. During this operation the glass plates must be maintained in proper registration so that proper positioning and aligning of the images upon both plates will be maintained. Following the preparation of these plates, the first negative plate is exposed to a sensitized metal plate. The second or subsequent glass plates are thereafter exposed to the sensitized metal plate which may be slightly developed and resensitized after each exposure if so desired. The exposures are made in the proper sequence but it is important that the several negative plates of the series, which are employed to reproduce the several images or part images, be located upon the sensitized metal plate in the identical positions they had during the make-up operations so that the several images may register properly with each other in the completed work. In registering a negative plate, register marks upon the plates were heretofore used in actual practice although various types of register frames have been suggested. These register frames likewise required the use of register marks upon the negative plates and the operator was also required to obtain registration by eye observation solely by aligning these marks one over another. Extreme care had to be exercised by the operator to secure perfect registration. Whether perfect registration would be obtained was only known after a number of exposures and prints were made.

One of the important objects of the invention is to provide a simple and efficient form of registering means that assures identical positioning of a number of negative plates of a series upon a sensitized surface or metal plate as they are exposed thereto in proper sequence so that the images thereby photographically reproduced upon this metal plate will have the same position as they had when stripped and laid upon the various superimposed negative plates during the make-up operation.

One embodiment of the invention may take the form of a pair of register rails provided with predetermined points of engagement against which the glass plates are held. One of the rails is designed to receive the negative plates during the stripping and the laying of the images upon these negative plates during make-up operations. The other rail is designed to receive a sensitized metal plate and each of the negative plates in their predetermined sequence of exposure. Registration marks or lines are not required. The operator is merely required to place these negative plates against the points of engagement provided upon the rails which, when done, will automatically effect reproducing the identical position of the negative plates upon the sensitized metal plate which they had when superimposed upon each other during the stripping and make-up operations.

A further advantage in the use of the invention resides in the fact that the novel feature of photographically reproducing the images of the negative plates during their successive exposures to a sensitized surface in the same relation as they had during their make-up operations is not dependent upon the negative plates being regular at the corners or along the edges, The negative plates may be irregular and the edges jagged and yet the advantages of the invention will be obtained without requiring register marks or lines of registration by eye observation of the operator. A considerable saving and perfect registration are thereby assured without experiencing the diffi-

culties that would otherwise result if the plates were not true or the edges were slightly chipped.

Other objects and advantages of the invention will be apparent from the following detail description when taken in connection with the accompanying drawings.

In the drawings:

Figure 1 shows the first negative glass plate in its position during its make-up operation, negative images being stripped from their backing and then turned over and laid upon this negative glass plate according to a predetermined layout obtained from suitable copy, photographs, drawings, illustrations or type proofs;

Fig. 2 is a transverse section taken along line 2—2 of Fig. 1 and in the direction of the arrows;

Fig. 3 is a view similar to Fig. 1 but showing additionally a second negative plate superimposed upon the first negative plate during the make-up operations and illustrating how the first of the register rails adapted for use in practicing the invention not only provides but maintains quick and easy registration of these negative plates in a predetermined relation while the second negative plate receives its negative images according to the aforesaid predetermined layout;

Fig. 4 is a transverse section taken along line 4—4 of Fig. 3 and in the direction of the arrows;

Fig. 5 is a view showing how the second of said register rails holds the sensitized surface in a predetermined position with respect to the first negative plate during the time it is exposed thereto;

Fig. 6 is a transverse section taken along line 6—6 of Fig. 5 and in the direction of the arrows;

Fig. 7 is a view of the sensitized surface after the first exposure to represent that it may be partially developed and resensitized if desired before the second exposure;

Fig. 8 is a view showing by means of the second register rail how the second negative plate is positioned with respect to the sensitized surface and during its exposure thereto, this second negative plate being in the same relation to the first negative plate as it was at the time it was superimposed and held in a predetermined position thereon by the first register rail as shown in Fig. 3;

Fig. 9 is a transverse section taken along line 9—9 in Fig. 8 and in the direction of the arrows;

Fig. 10 illustrates the sensitized surface after both exposures to show that the images of both plates have been photographically reproduced in the same relation as they had when both plates were in the position shown in Fig. 3 and after their make-up operations had been completed;

Fig. 11 is a perspective view of the first register rail; and

Fig. 12 is a similar view of the second register rail.

In the accompanying drawings, a pair of register rails is designated broadly as A and B. These rails may be made of any suitable material, such as metal, wood, cardboard, thermoplastic material, etc., and of a thickness and length necessary to accomplish their purpose.

Register rail A is provided with a leg 2 and a head portion 3. Two surfaces 4 and 5 of a predetermined angularity with respect to each other, preferably however that of right angles or 90 degrees, are provided at the juncture of leg 2 and head 3. A contact point 6 is provided on leg 2. This contact point 6 is in the form of an extension from leg 2, and its face or abutable surface or point is in alignment with surface 4. The location of surfaces 4 and 5 and contact point 6 on the register rail A need not be that shown. It is desirable however that the abuttable or outer surface of contact point 6 bear a predetermined relation to the surfaces 4 and 5 as will be later apparent.

Register rail B is similarly provided with a leg 7 and a head portion 8. Two surfaces 9 and 10 are also provided at the juncture of leg 7 and head 8. These surfaces 9 and 10 are of the same angularity with respect to each other, as are surfaces 4 and 5. A contact point 11 is similarly provided on leg 7. It is also in the form of an extension from leg 7, its face or abuttable surface or point being in alignment with surface 10. It is desirable that surfaces 9 and 10 and contact point 11 bear the same relation to each other as surfaces 4 and 5 bear to contact point 6. It is also desirable that these surfaces 9 and 10 and contact point 11 are similarly located and proportioned as the surfaces 4 and 5 and contact point 6. In other words, these parts on one rail should be complementary to the same parts on the other rail.

The second register rail B is also provided with a substantially flat member 12 of the same or different material as rail B and preferably of a thickness equal to the thickness of the metal plate carrying the sensitized surface to which the negative plates are exposed. Member 12 is secured to the underside of rail B in any desirable way. It also includes a leg 14 and a head portion 15. These parts act as a square or stop for the sensitized metal plate. They provide right angle edges 16 and 17 against which this sensitized metal plate abuts and against which the same is held in a relatively fixed relation during the time the negative glass plates are exposed thereto.

The method of effecting a predetermined registering relation during the make-up operations of the negative glass plates so that when these plates are in reversed position, they are exposed to a sensitized metal plate and the images upon the plates are photographically reproduced in the same relation as when stripped and flopped over upon these plates during the make-up operations according to a predetermined layout obtained from suitable copy, photographs, drawings, illustrations or type proofs, and the manner in which register rails A and B are used in connection therewith will be noted in Figs. 1 to 10, inclusive. In this regard, a glass plate 20 is placed with corner 21 thereof placed against surfaces 4 and 5 of register rail A. Glass plate 20 need not have its edges necessarily straight or its corner 21 exactly true. It is only necessary that edge 22 makes contact with surface 5, and edge 23 makes contact with surface 4. The lower part of edge 23 is then brought into abutting relation with contact point 6, thus providing in effect a three point contact with register rail A at points 4, 5, and 6. Plate 20 will rest in this position or relation until the operator has completed his make-up operations with respect thereto, which includes, as previously mentioned, stripping negative images, such as those indicated at 25, and positioning them upon plate 20 according to a predetermined design or layout.

After this step in the operation is completed, a second glass plate 26 is placed over or superimposed upon plate 20, as shown in Fig. 3. Negative images 27, whatever they may be, are stripped from their backings and flopped over and laid upon glass plate 26 with respect to images 25, so as to follow said predetermined design or

layout. In the case of photo engraving, images 27 may be reading matter that has been photographed for use with photographic illustrations exemplified by images 27. It will be understood that variations as to the character of the work to be performed are contemplated and that the invention does not pertain to the images to be used. While the images 27 are laid upon plate 26, the latter is held with its corner 28 against surfaces 4 and 5 of register rail A. Edge 29 of plate 26 abuts against surface 5 and edge 30 abuts against surface 4. The lower part of edge 30 is brought against contact point 6. Hence, plate 26 is held in the same relation against the abutting surfaces or points of register rail A as the plate 20 during their make-up operations, the plate 26 during its make-up operation being held or positioned upon plate 20 after the latter is completed.

To illustrate that these plates need not be true with respect to shape or corner regularity, and that the invention novelly allows the use of plates of irregular cuttings or shapes, plate 26 has been purposely shown exceptionally irregular to demonstrate how such irregularity does not affect the practicing of the invention. This is an advantage because any irregularity or chipping will not prevent use of the glass plate in this process, nor will corner irregularity, which is apt to occur, affect the exceptional accuracy of registration.

To reproduce the same relation between the images 25 and 27 during successive exposures of each glass plate 20 and 26 to a sensitized surface 31 that may, for example, be carried by a metal plate 32, the second register rail B first receives this sensitized plate 32 in the manner shown in Fig. 5. It is brought against edge 16 of leg 14 and against edge 17 of head 15 of member 12, it being desirable but not essential that its corner 33 be of the same angularity as that which exists between edges 16 and 17, so that this corner 33 will be firmly held against these edges. Plate 20 is then reversed so that its images 25 will face the sensitized surface 31 and its corner 21 will be positioned against the angularly related surfaces 9 and 10 on rail B. Edge 22 will abut against surface 9 and edge 23 will abut against surface 10, while the lower part of edge 23 will engage contact point 11. In this position, plate 20 will be in the very same relation with respect to these parts of rail B as it was with respect to corresponding parts of rail A. The plate is reversed as to position to place the surface carrying the images 25 face down and then these images are placed directly opposite sensitized surface 31. An exposure is then made to photographically reproduce images 25 upon a sensitized surface 31 as images 25'. As shown in Fig. 7, this surface 31 may then be partially developed and resensitized, if so desired, though this is not necessary.

Thereafter, the next negative glass plate to be exposed to sensitized surface 31 to make up the composite in accordance with a predetermined layout may be plate 26. Metal plate 32 is replaced in its position against edges 16 and 17 of member 12 on rail B. Glass plate 26 is then reversed or turned about so its corner 28 will fit against surfaces 9 and 10, the edge 29 being brought against surface 9 and the edge 30 being brought against surface 10. The lower edge will abut point 11 on rail B and the images 27 will be face down against sensitized surface 31. An exposure is then made to photographically reproduce images 27 as images 27' upon this surface 31, this being shown in Fig. 10.

The relation that images 27' will bear to images 25 will be exactly as shown in Fig. 3 during the make-up operation of the glass plate 26 in its superimposed positioning over plate 20 when the operator is placing images 27 upon this second plate 26 in a manner to carry out a predetermined design or layout with reference to images 25 on plate 20. The reproduction of this relation by the structure (rails A and B) and the steps herein described are extremely accurate. The use of registration marks, corner marks or lines upon the negative glass plates is eliminated, and hence, it is not necessary to rely upon the accuracy of the operator in effecting registration by eye observation. The necessity of waiting until all exposures to metal plate 32 and a print thereof is made before it is known whether accurate registration has been obtained is eliminated. Not only are material and labor saved but also time in carrying out a job.

It will be noted, therefore, that the registering relation during the make-up operations and its reproduction during the successive exposures of the negative glass plates to the sensitized surface is in one sense of the term automatic. The same relation of the images when reproduced photographically on the sensitized surface must be the same as long as the negative glass plates are brought into abutting relation with the surfaces or points designated as 4, 5 and 6 in connection with the use of rail A, and designated as 9, 10 and 11 in connection with the use of rail B. It will be observed that the disclosure is not to be limited to any given number of negative glass plates, because any number of exposures might be made upon sensitized surface 31. Nor is the exact construction of rails A and B, either as separate parts or as elongated members, important as long as the abutting surfaces or points are provided.

The construction of register rails A and B and their use are extremely simple. The reproduction photographically of the registration relation between negative plates during the make-up operation is accurate and assured. Errors are eliminated and the work may be performed in minimum time.

Without further elaboration, the foregoing will so fully explain the gist of our invention that others may, by applying current knowledge, readily adopt the same for use under varying conditions of service, without eliminating certain features, which may properly be said to constitute the essential items of novelty involved, which items are intended to be defined and secured to us by the following claims.

We claim:

1. The method of effecting a predetermined registering relation of a series of photographic negative plates during make-up operations and reproducing the same relation during successive exposures of each negative plate to a sensitized surface which comprises placing corresponding corners of the negative plates while in superimposed relation during make-up operations against adjoining surfaces of predetermined angularity, abutting corresponding edges of these negative plates against a contact point disposed in aligning relation to one of said adjoining surfaces, then reversing the negative plates for successive exposures to a sensitized surface to photographically reproduce during said successive exposures the images of said

plates in the same relation as they had with respect to each other while in superimposed relation which includes placing the same corresponding corners of each plate against a second set of adjoining surfaces having the same predetermined angularity as the first mentioned adjoining surfaces, and abutting the same corresponding edges of said plates against a second contact point also in the same aligning relation to one of said second set of adjoining surfaces as said first contact point with respect to the corresponding surface of said first set of adjoining surfaces.

2. The method of effecting a predetermined registering relation of a series of photographic negative plates during make-up operations and reproducing the same relation during successive exposures of each negative plate to a sensitized surface which comprises placing a corner of each negative plate against two right angular surfaces so that each negative plate has at least one point of contact at its corner with each of the two right angular surfaces, then abutting an edge of each plate coextending from its said corner with a contact point in aligning relation with one of said right angular surfaces effecting such positioning of said plates in superimposed relation during make-up operations, thereafter reversing said plates for successive exposures to a sensitized surface to photographically reproduce during said successive exposures the images of said plates in their same relation as they had with respect to each other while the plates were in superimposed relation which includes placing the same said corners of said plates against a second of two right angular surfaces that are of a complementary relation with respect to said first two right angular surfaces so that each negative plate will have substantially the same points of contact in engagement therewith, and then abutting the said coextending edges against a contact point also similarly in alignment with one of said second two right angular surfaces.

3. The method of effecting a predetermined registering relation between a series of negative plates and thereafter reproducing the same relation during exposure to a sensitized surface which comprises placing corresponding corners of the negative plates while in superimposed relation against adjoining surfaces of predetermined angularity, abutting corresponding edges of these negative plates against a contact point disposed in aligning relation to one of said adjoining surfaces, then reversing the negative plates and placing the same corresponding corners of each plate against a second set of adjoining surfaces having the same predetermined angularity as the first mentioned adjoining surfaces, thereafter placing the same corresponding edges of said plates against a second contact point also in the same aligning relation to an adjoining surface corresponding to the adjoining surface in aligning relation to the first point, and exposing each of said negative plates as positioned to a sensitized surface.

4. The method of effecting a predetermined registering relation of a series of photographic plates and subsequently reproducing the same relation while the plates are in a reversed position which comprises placing corresponding corners of the plates against adjoining surfaces of predetermined angularity, abutting corresponding edges of these plates against a contact point disposed in aligning relation to one of said adjoining surfaces, then reversing the plates which includes placing the same corresponding corners of each plate against a second set of adjoining surfaces having the same predetermined angularity as the first mentioned adjoining surfaces, and abutting the same corresponding edges of said plates against a second contact point also in the same aligning relation to one of the second set of adjoining surfaces as said first contact point with respect to the corresponding surface of said first set of adjoining surfaces.

5. Structure of the type described comprising in combination a pair of register rails, each having two adjoining surfaces of predetermined angularity and a spaced point of abutment in the same plane as one of said surfaces, the surfaces and the point of abutment on each rail being complementary to the surfaces and the point of abutment on the other rail whereby the same registration relation between a plurality of photographic plates in abutment with said three points of contact on one rail will be reproduced when said plates are reversed and caused to abut the said three points of contact on the other rail.

6. Structure of the type described comprising in combination a pair of register rails, each having two adjoining surfaces of predetermined angularity and a spaced point of abutment in the same plane as one of said surfaces, the surfaces and the point of abutment on each rail being complementary to the surfaces and the point of abutment on the other rail whereby the same registration relation between a plurality of photographic plates in abutment with said three points of contact on one rail will be reproduced when said plates are reversed and caused to abut the said three points of contact on the other rail, and a member having two receiving edges arranged in a predetermined angular relation, said member being attached to one of said rails with said receiving edges in proximity to said angular surfaces and abutting point on said rail.

7. Structure of the type described comprising in combination a pair of elongated register rails, each having two right angular adjoining surfaces and a spaced point of abutment, said surfaces and said point of abutment on each rail forming a three point contact for a photographic plate, said surfaces and the point of abutment on each rail being complementary to the surfaces and the point of abutment on the other rail whereby the same registration relation between a plurality of photographic plates in abutment with said three points of contact on one rail will be reproduced when said plates are reversed and caused to abut the said three points of contact on the other rail.

8. Structure of the type described comprising in combination a pair of elongated register rails, each having two right angular adjoining surfaces and a spaced point of abutment, said surfaces and said point of abutment on each rail forming a three point contact for a photographic plate, said surfaces and the point of abutment on each rail being complementary to the surfaces and the point of abutment on the other rail whereby the same registration relation between a plurality of photographic plates in abutment with said three points of contact on one rail will be reproduced when said plates are reversed and caused to abut the said three points of contact on the other rail, and a member on said other rail for maintaining a sensitized surface in a given position while said photographic plates are reversed and caused to abut the said three points of contact on said other rail.

9. Structure of the type described comprising in combination a pair of complementary register rails, means for causing a plurality of photographic plates to abut one of said rails in a predetermined relation when superimposed one upon the other, means for causing said photographic plates when reversed in position to abut the other rail in the same predetermined relation, and means for holding a plate having a sensitized surface thereon in a given position for exposure of said photographic plates thereto when said plates are caused to abut said other rail in said predetermined relation.

CLEMENT A. MAWICKE.
HAROLD W. OLSEN.