

July 14, 1925.

1,545,958

R. J. GREENWAY

ART OF TREATING PRINTING PLATES

Filed July 6, 1923

3 Sheets-Sheet 1

Fig. 1.

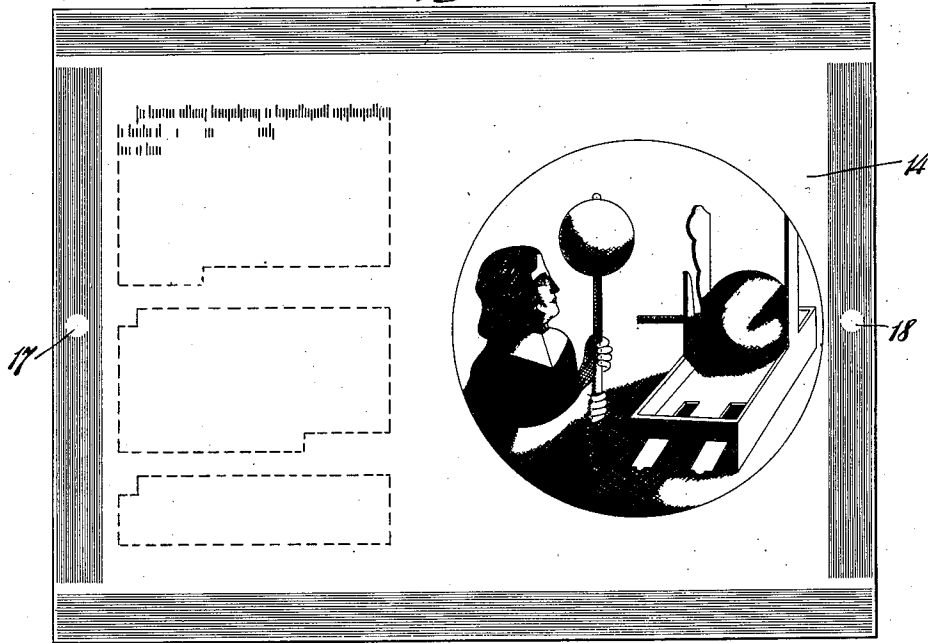
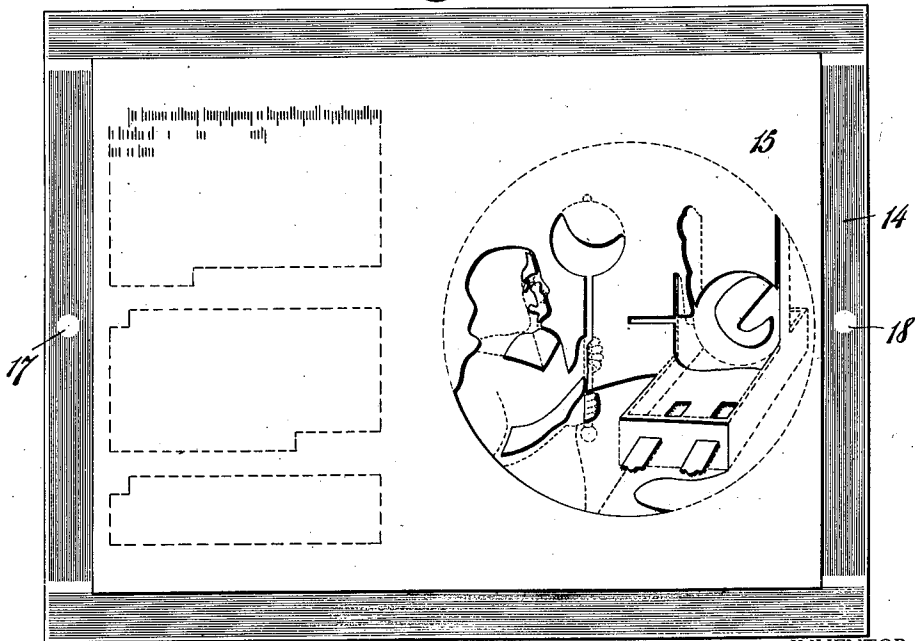


Fig. 2.



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3 Sheets-Sheet 2

Fig. 3.

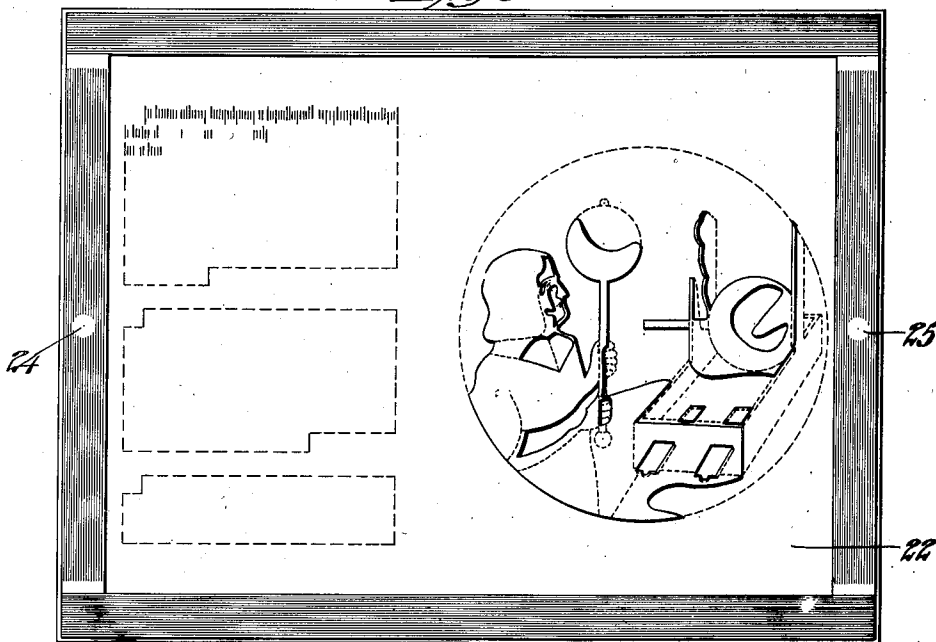
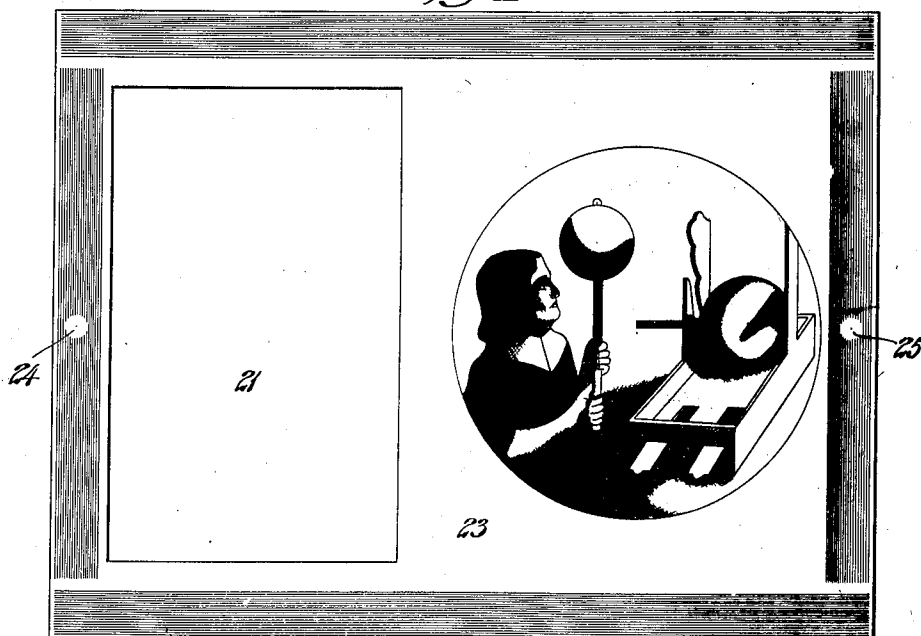


Fig. 4.



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3 Sheets-Sheet 3

Fig.5.

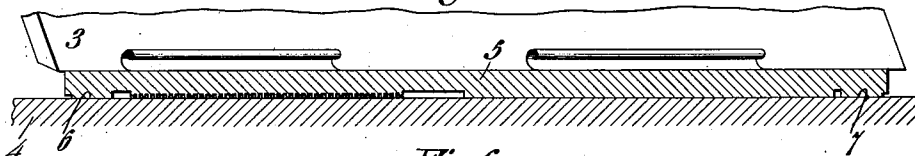


Fig.6.



Fig.7.



Fig.8.



Fig.9.

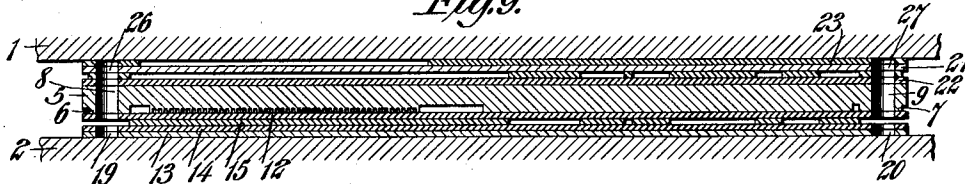


Fig.10.

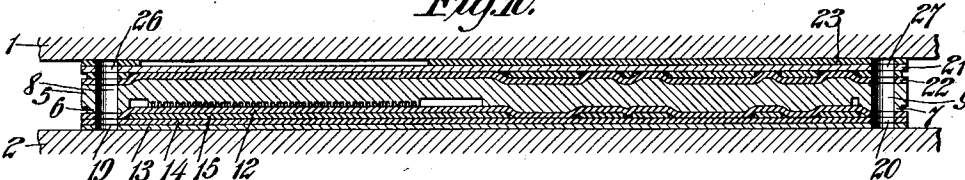


Fig.11.

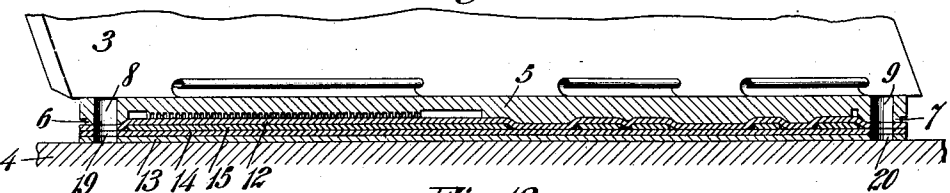


Fig.12.



INVENTOR
Richard J. Greenway
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his ATTORNEYS

UNITED STATES PATENT OFFICE.

RICHARD J. GREENWAY, OF WESTERLY, RHODE ISLAND, ASSIGNOR TO C. B. COTTRELL & SONS COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

ART OF TREATING PRINTING PLATES.

Application filed July 6, 1923. Serial No. 649,837.

To all whom it may concern:

Be it known that I, RICHARD J. GREENWAY, a citizen of the United States, and resident of Westerly, in the county of Washington and State of Rhode Island, have invented a new and useful Improvement in the Art of Treating Printing Plates, of which the following is a specification.

My invention relates to improvements in that branch of the art of treating manufactured relief printing plates where the "make-ready" or the desired graduated printing surface is produced in the face of the plate as distinguished from those branches of the art where the "making ready" consists in "underlaying" the plate or in "overlaying" the impression surface; both of which latter methods are slow and expensive and require great skill to secure fine effects.

The object of my invention is to provide certain improvements in the method of treating printing plates whereby the exact character of the printing surface in the plate desired may be rapidly, easily and inexpensively produced.

My invention more particularly includes certain steps in the method of treating the printing plate whereby exact register is obtained and retained between the plate and the means applied to the back and face of the plate to produce the desired graduations in the printing face of the plate.

In carrying out my invention in its most complete form in connection with a manufactured relief plate having both "pictorial" and "type" matter, I proceed as follows:—

I take the printing plate and drill registry holes therethrough in the "bearers", said registry holes being preferably of considerable size so as to make them effective in the subsequent registry operations between the plate and its back and face matrices, both for longitudinal and lateral registration. I preferably drill two of these registry holes, one at the top and one at the bottom of the plate.

I then even or level the back of the printing plate, as by shaving the same to the desired extent.

I then print a number of proofs from the

plate and ascertain therefrom the corrections which should be made in the face of the plate for producing the desired printing effects. These proofs will also show the registry hole impressions thereon.

When the corrections to be made in the face of the plate have been determined by the examination of the proof sheets, the proof sheet which is to be applied to the face of the plate will have its "solids" or heavy impression surfaces cut-out and the proof sheet which is to be applied to the back of the plate will have the corresponding "solids" or impression surfaces built-up, preferably with the portions which were cut-out of the first named proof so as to ensure accuracy and save time.

These proofs are then applied in register to the back and face of the plate and the plate with the so applied proofs is subjected to heat and pressure, the complementary surfaces of the built-up and cut-out proofs coacting to produce the desired graduated printing surface in the face of the plate. These cut-out and built-up proofs constitute what I will hereafter designate as "face" and "back" matrices respectively.

In practice I suitably mount the proofs which go to form the matrices and then apply and secure them in register on the back and face of the plate as follows:—

For the face matrix I paste the back of a first proof sheet onto a thin metal sheet. I cut the "solids" or heavy impression surfaces out of a second proof sheet and paste the back of the so cut-out sheet onto the face of the first proof sheet in register. I then paste the back of a third proof sheet onto the face of the cut-out proof sheet in register. I then punch or cut-out the so assembled sheets at the registry hole impressions to form holes which are to be utilized to bring the matrix into register with the plate. The face matrix is then completed.

For the back matrix I take a proof sheet and build up the "solids" or heavy impression surfaces on its face, preferably by pasting the portions which were cut-out of the face proof sheet, onto the "solids" or heavy impression surfaces of the back proof sheet.

I then paste the face of this built-up proof sheet onto a thin metal sheet. I then punch or cut-out the so assembled sheets at their registry hole impressions to form holes which are to be utilized to bring the matrix into register with the printing plate. I then take another proof sheet and punch out the registry hole impressions and also cut-out the type matter portions thereof and paste the back of the so cut-out proof sheet onto the other side of the thin metal sheet just above referred to, in proper register. The back matrix is then completed.

I then apply the cut-out or face matrix to the face of the plate with or without the interposition of a sheet of blotting paper or other soft material.

I also apply the built-up or back matrix to the back of the plate. These matrices are brought into register with the plate by inserting registry pins through the registry holes in the plate and matrices. These registry pins will bring the matrices into perfect longitudinal and lateral register on the plate with the low or cut-out "solids" of the face matrix in register with the high or built-up "solids" of the back matrix, the one being complementary of the other. The matrices may then be secured to the plate while the registry pins are still in the holes. One way of securing the matrices to the plate would be by the use of tacks.

I then remove the registry pins and the assembled plate and matrices are inserted between the two pressure surfaces of a press, preferably heated surfaces. The assembled plate and matrices are then subjected to sufficient pressure and, if necessary, heat, to permanently produce the desired graduated printing surface in the face of the plate.

The instrumentalities used for carrying out my invention are represented in the accompanying drawings, in which—

Fig. 1 represents a face view of a sheet bearing a proof impression taken from the printing plate and showing the impressions of the registry holes which were drilled through the plate.

Fig. 2 represents a face view of a proof sheet showing the "solids" of the pictorial matter cut-out.

Fig. 3 represents a face view of another proof, showing the corresponding "solids" of the pictorial matter built-up.

Fig. 4 represents a face view of still another proof sheet, showing the type matter cut-out.

Fig. 5 represents a longitudinal section, showing the back of the plate being evened.

Fig. 6 represents a similar section through the matrix which is to be applied to the face of the plate.

Fig. 7 represents a similar section through the matrix which is to be applied to the back of the plate.

Fig. 8 represents a similar section, showing the plate with the face and back matrices held in registry by the registry pins.

Fig. 9 represents a similar section, showing the assembled plate and matrices in the press ready to be subjected to heat and pressure.

Fig. 10 represents a similar section, showing the assembled plate and matrices after they have been subjected to heat and pressure, to produce the desired elevations and depressions in the face of the plate.

Fig. 11 represents a similar section, showing the back matrix removed and the back of the plate being shaved to even it while the face matrix is still applied to the face of the plate.

Fig. 12 represents a similar section through the completed plate.

In the drawings the thicknesses of the sheets employed in the process and the scarcely visible graduations in the printing surface of the plate are greatly exaggerated for imparting a clearer understanding of the process.

The upper and lower pressure surfaces of a press are denoted by 1 and 2. These surfaces may be suitably heated in any well known or approved manner, if so desired. The shaving knife is denoted by 3 and the bed of the shaving machine by 4.

The printing plate is denoted by 5, its opposite bearers by 6 and 7 and the registry holes therethrough by 8 and 9. The removable registry pins are denoted by 10 and 11.

The sheet of blotting paper or other soft material which may or may not be interposed between the face matrix and face of the plate, is denoted by 12.

The thin metal sheet which forms a part of the face matrix is denoted by 13. The first proof sheet which is pasted thereto, is denoted by 14, and the cut-out second proof sheet is denoted by 15. The registry hole impressions are denoted by 17 and 18 and the holes themselves by 19 and 20.

The thin metal sheet which forms a part of the back matrix is denoted by 21, the built-up proof sheet which is pasted on one side thereof is denoted by 22, and the proof sheet with the type matter cut-out, which is applied to the other side of the thin metal sheet, is denoted by 23. The registry hole impressions are denoted by 24 and 25 and the holes themselves by 26 and 27.

It will be seen that I produce the desired graduated printing surface or "make-ready" in the face of the printing plate, by the utilization of matrices applied respectively to the face and back of the plate, the face matrix having low or cut-out portions at the desired points, and the back matrix having high or built-up portions at the same points, the surfaces of the two matrices being

complementary so that when the assembled sheet and matrices are subjected to the required heat and pressure, the unsupported portions at the face of the plate are readily
 5 forced into the cut-out portions of the face matrix by the built-up portions of the back matrix. By this method a very simple, quick, easy and inexpensive way of producing the graduated printing surface in the
 10 face of the plate is obtained, requiring not only a lesser application of heat and power than heretofore, but also producing superior results.

It is evident that various steps in the process may be omitted, if so desired, and also that the face and back matrices may be produced in different ways without departing from the spirit and scope of my invention; hence, I do not wish to be limited to
 20 the number nor the order of the steps herein set forth, nor to the manner of producing the matrices, but—

What I claim is:—

1. That improvement in the art of treating
 25 printing plates which consists in printing proofs from the plate, cutting out predetermined portions from one proof and building up the corresponding predetermined portions of the other proof with said
 30 cut-out portions, applying the built-up and cut-out proofs to the back and face respectively of the plate, and subjecting the same to pressure to produce the desired graduated printing surface in the face of the
 35 plate.

2. That improvement in the art of treating printing plates which consists in printing proofs from the plate, cutting out predetermined portions from one proof and
 40 building up the corresponding predetermined portions of the other proof with said cut-out portions, applying the built-up and cut-out proofs to the back and face respectively of the plate, and subjecting the same
 45 to heat and pressure to produce the desired graduated printing surface in the face of the plate.

3. That improvement in the art of treating printing plates which consists in printing proofs from the plate, cutting out the solids from one proof and building up the solids of the other proof with said cut-out
 50 portions, applying the built-up and cut-out proofs to the back and face respectively of the plate, and subjecting the same to pressure to produce the desired graduated printing surface in the face of the plate.

4. That improvement in the art of treating printing plates which consists in printing proofs from the plate, cutting out the solids from one proof and building up the solids of the other proof with said cut-out
 60 portions, applying the built-up and cut-out proofs to the back and face respectively of the plate, and subjecting the same to heat

and pressure to produce the desired graduated printing surface in the face of the plate.

5. That improvement in the art of treating printing plates having combined type
 70 matter and pictorial illustrations which consists in printing proofs from the plate, cutting out the solids from one of the proofs and building up the solids of the other proof, cutting out another proof over the type
 75 matter and securing it in registry to the built-up proof, applying the built-up and cut-out proofs to the back and face respectively of the plate, and subjecting the same to pressure to produce the desired graduated
 80 printing surface in the face of the plate.

6. That improvement in the art of treating printing plates having combined type matter and pictorial illustrations which consists in printing proofs from the plate, cutting out
 85 the solids from one of the proofs and building up the solids of the other proof with said cut-out portions, cutting out another proof over the type matter and securing it in registry to the built-up proof, applying the
 90 built-up and cut-out proofs to the back and face respectively of the plate, and subjecting the same to pressure to produce the desired graduated printing surface in the face of the plate.

7. That improvement in the art of treating printing plates having combined type matter and pictorial illustrations which consists in printing proofs from the plate, cutting out the solids from one of the proofs
 100 and building up the solids of the other proof, cutting out another proof over the type matter and securing it in registry to the built-up proof, applying the built-up and cut-out proofs to the back and face respectively
 105 of the plate, and subjecting the same to heat and pressure to produce the desired graduated printing surface in the face of the plate.

8. That improvement in the art of treating printing plates having combined type matter and pictorial illustrations, which consists in printing proofs from the plate, cutting out the solids from one of the proofs
 110 and building up the solids of the other proof with said cut-out portions, cutting out another proof over the type matter and securing it in registry to the built-up proof, applying the built-up and cut-out proofs to the back and face respectively of the plate,
 120 and subjecting the same to heat and pressure to produce the desired graduated printing surface in the face of the plate.

9. That improvement in the art of treating printing plates which consists in drilling
 125 registry holes through the plate, printing proofs from the plate showing the impressions of said registry holes, cutting out the registry hole impressions from the proofs, cutting out the solids from one proof
 130

graduated printing surface in the face of the plate, removing the built-up proof from the plate and evening the back of the plate with the cut-out proof still applied to the face of the plate.

13. That improvement in the art of treating printing plates which consists in drilling registry holes through the plate bearers, evening the back of the plate, printing proofs from the plate showing the impressions of said registry holes, cutting out the registry hole impressions from the proofs, cutting out the solids from one proof and building up the solids of the other proof, applying the built-up and cut-out proofs to the back and face respectively of the plate, inserting registry pins through the plate and proofs to insure accurate registry, securing the proofs to the plate, removing the registry pins, and subjecting the plate with the proofs secured thereto, to pressure to produce the desired graduated printing surface in the face of the plate.

14. That improvement in the art of treating printing plates which consists in drilling registry holes through the plate bearers, evening the back of the plate, printing proofs from the plate showing the impressions of said registry holes, cutting out the registry hole impressions from the proofs, cutting out the solids from one proof and building up the solids of the other proof, applying the built-up and cut-out proofs to the back and face respectively of the plate, inserting registry pins through the plate and proofs to insure accurate registry, securing the proofs to the plate, removing the registry pins and subjecting the plate with the proofs secured thereto, to heat and pressure to produce the desired graduated printing surface in the face of the plate.

15. That improvement in the art of treating printing plates which consists in drilling registry holes through the plate bearers, evening the back of the plate, printing proofs from the plate showing the impressions of said registry holes, cutting out the registry hole impressions from the proofs, cutting out the solids from one proof and building up the solids of the other proof, applying the built-up and cut-out proofs to the back and face respectively of the plate, inserting registry pins through the plate and proofs to insure accurate registry, securing the proofs to the plate, removing the registry pins, subjecting the plate with the proofs secured thereto, to pressure to produce the desired graduated printing surface in the face of the plate, removing the built-up proof from the plate and evening the back of the plate with the cut-out proof still applied to the face of the plate.

16. That improvement in the art of treating printing plates which consists in drilling registry holes through the plate bearers, &c.

evening the back of the plate, printing proofs from the plate showing the impressions of said registry holes, cutting out the registry hole impressions from the proofs, cutting out the solids from one proof and building up the solids of the other proof, applying the built-up and cut-out proofs to the back and face respectively of the plate, inserting registry pins through the plate and proofs to insure accurate registry, securing the proofs to the plate, removing the registry pins, subjecting the plate with the proofs secured thereto, to heat and pressure to produce the desired graduated printing surface in the face of the plate, removing the built-up proof from the plate and evening the back of the plate with the cut-out proof still applied to the face of the plate.

17. That improvement in the art of treating printing plates which consists in drilling registry holes through the plate, printing proofs from the plate showing the impressions of said registry holes, cutting out the registry hole impressions from the proofs and utilizing said holes for bringing the plate and proofs into accurate register.

18. That improvement in the art of treating printing plates which consists in drilling registry holes through the plate bear-

ers, printing proofs from the plate showing the impressions of said registry holes, cutting out the registry hole impressions from the proofs and utilizing said holes for bringing the plate and proofs into accurate register.

19. That improvement in the art of treating printing plates which consists in drilling registry holes through the plate, printing proofs from the plate showing the impressions of said registry holes, cutting out the registry hole impressions from the proofs and utilizing registry pins inserted through said holes for bringing the plate and proofs into accurate register.

20. That improvement in the art of treating printing plates which consists in drilling registry holes through the plate bearers, printing proofs from the plate showing the impressions of said registry holes, cutting out the registry hole impressions from the proofs and utilizing registry pins inserted through said holes for bringing the plate and proofs into accurate register.

In testimony that I claim the foregoing as my invention, I have signed my name this second day of July A. D. 1923.

RICHARD J. GREENWAY.