H. A. W. WOOD.

METHOD OF REPRODUCING INTAGLIO PRINTING SURFACES.

APPLICATION FILED JUNE 21, 1911. RENEWED FEB. 27, 1915.

1,151,317. Patented Aug. 24, 1915.

Fig. 1.

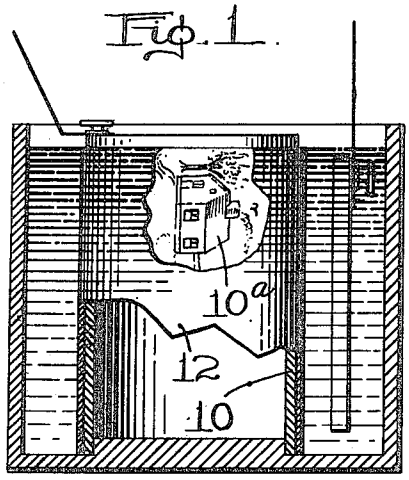


Fig. 2.

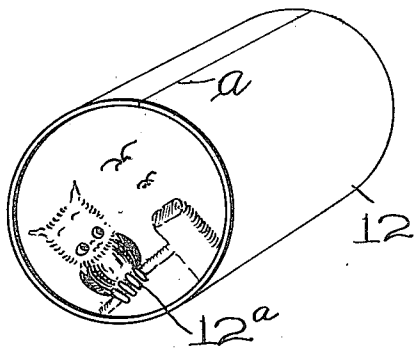


Fig. 3.

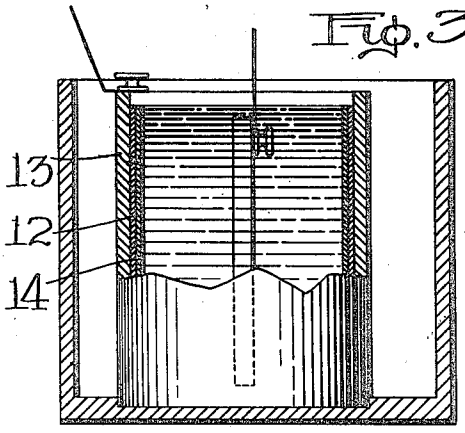


Fig. 5.

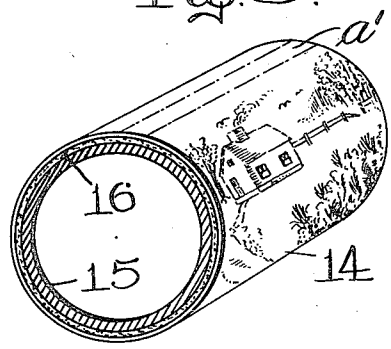


Fig. 4.

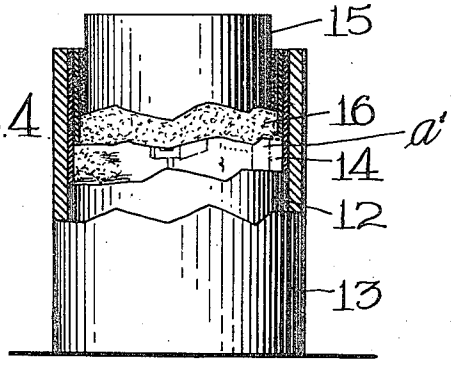
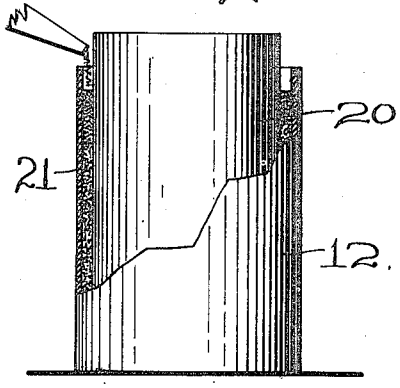


Fig. 6.



Witnesses:
C. F. Wesson.
C. A. Hartnett

Inventor
H. A. W. Wood
By Attorneys
Southgate & Southgate

UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO WOOD & NATHAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

METHOD OF REPRODUCING INTAGLIO-PRINTING SURFACES.

1,151,317. Specification of Letters Patent. Patented Aug. 24, 1915.

Application filed June 21, 1911, Serial No. 634,529. Renewed February 27, 1915. Serial No. 11,084.

To all whom it may concern:

Be it known that I, HENRY A. WISE WOOD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Method of Reproducing Intaglio-Printing Surfaces, of which the following is a specification.

The principal object of this invention is to provide a way of accurately reproducing intaglio printing surfaces, particularly those which are curved. The invention also involves a method whereby this can be accomplished by electro deposition in a very expeditious manner.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a central transverse sectional view showing the production of a shell on the exterior of an etched cylinder constituting the first complete step of the process; Fig. 2 is a perspective view of this shell removed from the original cylinder; Fig. 3 is a central transverse sectional view of this shell inserted in a tube while receiving the electrodeposition of a printing cylinder therein; Fig. 4 is a central transverse sectional view of the same elements removed from the electroplating bath and showing the application of a backing thereto; Fig. 5 is a perspective view of the product with the end in section; and Fig. 6 is a central transverse sectional view showing the last step in the production of a curved stereotype plate in a similar way according to this method.

Machine photogravure or intaglio printing is now done from copper cylinders which are highly polished and thereafter etched with the design. Such a cylinder of course has the design in intaglio upon its surface. While printing it is covered with ink which before each impression is scraped off by means of a smooth edged doctor to leave the ink only in the depressions constituting the intaglio design. It is necessary of course that all the non-printing surfaces of the plate shall be highly polished and free from pits or scratches as is well understood. This kind of printing is capable of being used for the highest class of work and it is desirable to use it wherever it can be adopted. However, it is impractical as a general thing for newspaper and commercial printing, because original etchings must now be used in all instances. There is no known practicable way of reproducing them in such a manner as relief printing press plates are reproduced by electro-typing and stereotyping processes. This invention, therefore, is for the purpose of providing a cheaply practicable way of reproducing these printing surfaces so that they can be used for newspaper and commercial printing, thus greatly enhancing the value and use of this system of printing. In order to secure this result an etched cylinder 10 of copper, made as usual, and suitable for use in the above mentioned kind of printing, is employed. First, if necessary, it may be dusted over with a film of conducting material, as for example, black lead. This is blown out of the design and off the surface so as to leave a thin easily separated conducting skin over the cylinder, but such a skin is not always necessary. The cylinder is placed in an electroplating bath. Here it is electroplated with an external shell 12 of copper, nickel, or other metal, as shown in Fig. 1. This shell may be thick or thin. If not sufficiently thick it must be outwardly reinforced for subsequent steps. Whenever this shell 12 is to be reinforced and is not sufficiently smooth and true on its back it may be smoothed up by burnishing or can even be turned up or ground in a lathe so that it may be perfectly smooth and cylindrical if desired for reinforcement. This shell is then removed from the cylinder.

One way in which it can be removed is by slitting it longitudinally at a by means of a knife or the like from one end of the cylinder to the other preferably along what would constitute a margin a' of the sheet to be printed. The shell is then carefully stripped from the cylinder and, of course, it will be found to contain on its inner surface a relief reproduction 12^a of the intaglio design 10^a. Another way in which this shell may be freed from the original cylinder without splitting it is by placing the cylinder and shell for a short period of time in an oven and quickly applying heat to this new shell 12. This causes the shell to expand enough to be drawn off, providing the design is not etched too deeply. Another way which I regard as still better is to continue the above mentioned smoothing opera-

tion by running the shell (on the cylinder) in a lathe in contact with a burnishing tool or with another cylinder until the shell is stretched slightly and freed from the cylinder. In either of these latter cases the shell may be drawn off from the cylinder longitudinally.

However the shell is removed, it is obvious that it will have the relief design inside and that if desired, its back being smooth and cylindrical, it can be inserted in a hollow member 13, preferably a cylindrical tube, the bore of which is but slightly larger than the external diameter of the original cylinder 10. In this tube the shell 12 snugly fits the inside surface. Its inner surface may if desired be dusted over with black lead or the like, which is blown out as usual. This may be done before or after it is put in the tube, or the step may be omitted altogether. The tube and shell are then put into an electroplating bath and the inner side of the shell is thereby coated with nickel, copper, or other metal until the desired thickness is secured to form a duplicate 14 of the surface of the original cylinder. Or, if the deposited shell has been made thick enough to preserve its rotundity a reinforcing tube is not necessary, as the shell alone without the tube may be subjected to the rest of the process. The tube and shell with this duplicate or the shell alone as the case may be are then removed from the bath and a core or mandrel 15 placed in the center thereof. This core of course may be small enough to allow a space between it and the newly deposited shell 14 to permit a backing metal 16 to be poured in. When backing is accomplished the core 15 will be firmly united with the new shell 14 so that when they are drawn out of the tube the first shell 12 can be stripped from them and they will constitute a printing cylinder having a correct electrotyped reproduction of the original design. The first shell 12 may be stripped from this new cylinder in any of the ways heretofore described, and it can be used many times so that a number of plates or cylinders can be made from the single original cylinder.

It will be understood, of course, that the seam which is made when the first shell 12 is split to remove it from the cylinder will be reproduced in the second shell. This, however, can be removed by burnishing, when the electrotyped cylinder will be in proper condition for printing. In order to make a stereotype plate in a similar way, instead of placing the tube 13 and shell 12 in a bath, a core 20 is inserted and stereotype metal 21 is poured between the core and this shell as indicated diagrammatically in Fig. 6. When the shell 12 is stripped and the seam-mark burnished off, a plate is found constituting a good stereotype reproduction of the original. In this way it will be seen that the original engraved or etched cylinder or a curved segmental plate can be reproduced in a very accurate manner. This process greatly extends the value of the intaglio method of printing and enables it to be made use of more cheaply and therefore more widely than is at present possible.

Although I have shown and described two preferred orders of steps, I am aware that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to the precise order of steps herein described, but

What I do claim is:—

1. The method of reproducing cylindrical intaglio printing surfaces which consists in forming by electro-deposition a negative of the surface to be reproduced in the form of a thin metallic shell, removing said shell from the curved original, placing it in a tube of suitable diameter, electro-depositing on the inside of said shell a coating or shell of metal, placing the tube and two shells over a core, casting a backing on the inside of the last produced shell, and finally removing the tube and first shell.

2. The method of reproducing cylindrical intaglio printing surfaces which consists in forming by electro-deposition a negative of the surface to be reproduced in the form of a thin metallic shell, flexing said shell to remove it from the curved original, electro-depositing on the inside of said shell a coating or shell of metal, placing the new shell over a core, and casting a backing on the inside of the last produced shell.

3. The method of reproducing cylindrical intaglio printing surfaces which consists in forming by electro-deposition a negative of the surface to be reproduced in the form of a thin metallic shell on the outside of a curved original, stretching said shell to enlarge it, removing it from the curved original, forming a positive inside the shell, and finally removing said shell from the positive.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

HENRY A. WISE WOOD

Witnesses:

ELIZABETH OGDEN WOOD,

KATE B. HAYES.