E. L. FELL.

PROCESS OF PRINTING.

APPLICATION FILED NOV. 24, 1909.

987,351.

Patented Mar. 21, 1911.

FIG. 3.

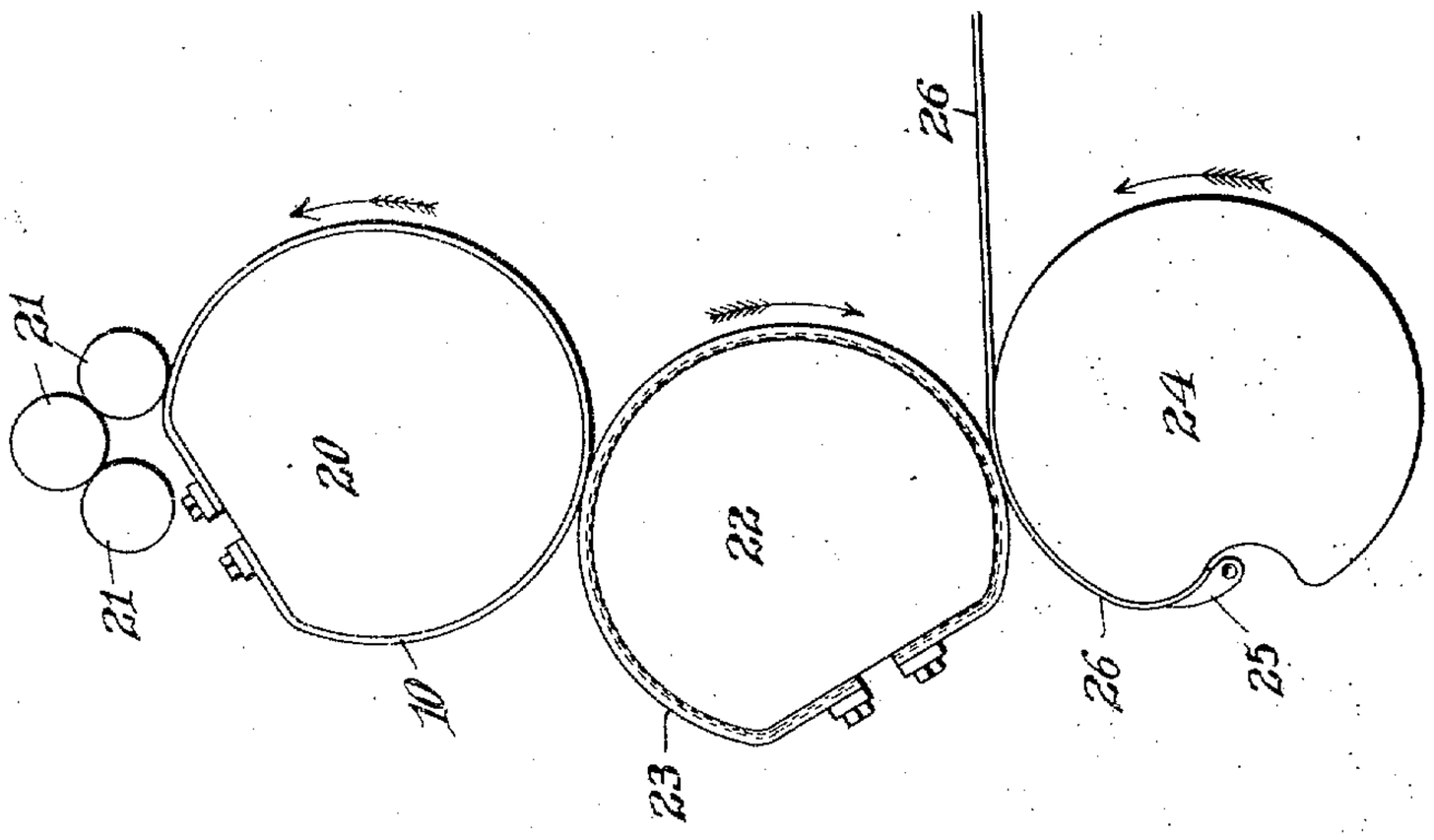


FIG. 1.

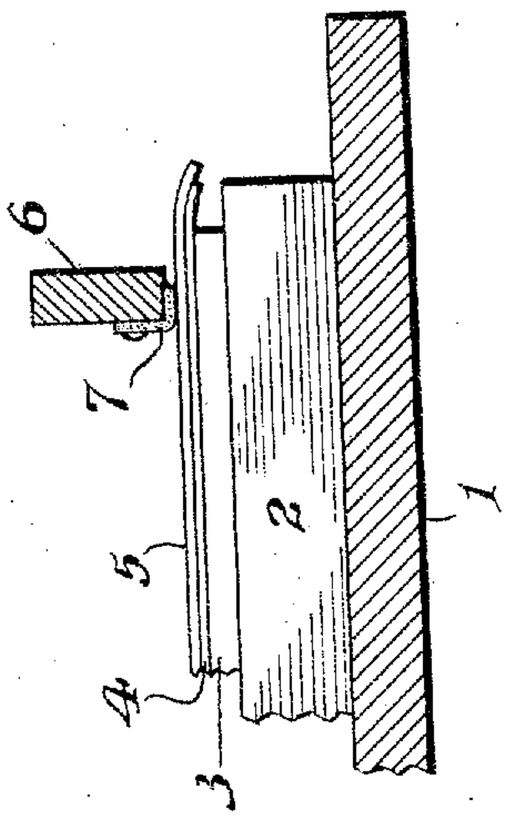
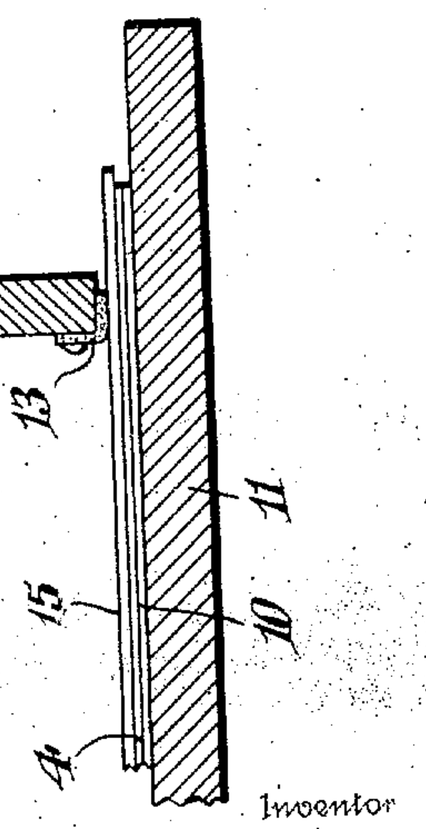


FIG. 2.



Witnesses

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PROCESS OF PRINTING.

987,351. Specification of Letters Patent. Patented Mar. 21, 1911.

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To all whom it may concern:

Be it known that I, EDWARD LAWRENCE FELL, a citizen of the United States, residing in the city of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in the Process of Printing, of which the following is a specification.

My invention relates broadly to improvements in the process of printing, and it has for its object to provide an improvement in the process of reproducing from half-tone intaglio plates (that is to say, intaglio plates in the making of which screens are employed) a design or picture in which the high lights and the low lights are in sharp, well-defined contrast.

By the employment of a half-tone intaglio printing plate in the practicing and carrying out of my invention, I am enabled to secure an accurate gradation and variation of tone effects and thereby produce a design or picture of superior artistic merit.

Heretofore, as far as I am aware, it has been the practice to print directly from half-tone intaglio plates (as, for instance, by the steel plate press), but I have found that by transferring the design or picture from the intaglio half-tone printing plate by certain steps or means to an elastic printing member, such, for instance, as the offset cylinder found in the well-known offset printing press, and printing from the said member instead of directly from the plate, a much more desirable and artistic result is obtained.

In the carrying out of my process a half-tone intaglio plate of copper or other suitable metal is etched in any known manner. After the preparation of the plate ink is applied thereto and enters the cavities in the surface. The said ink is then transferred to a transfer member, such, for instance, as a thin sheet of transfer paper of the character now generally used for such purposes. After having made the transfer of the picture or design to the transfer sheet, if it be found that too much ink has been left in the cavities and transferred to the said transfer member, the said cavities may be again filled with ink and a certain portion of the same wiped out or withdrawn therefrom before making the transfer to the transfer member, for instance, a sheet of paper. Or if it be found that insufficient ink has been left in the cavities of the plate, a larger amount of ink may be left therein to be taken or sucked out by the transfer sheet or other form of transfer member. By this means the tone or depth of color and the relation of the high lights and the low lights may be varied to produce the finest shades of difference in effect and in some measure the ideal result which is sought may be realized. When it is remembered that in the carrying out of my process the final result, that is to say the finished printed picture or design, is substantially a reproduction of the picture including its shades, gradations and variations of depth of color and effect of the picture or design on the transfer sheet, the importance of being able to manipulate the said picture or design to produce the exact effect desired on the said transfer sheet will be understood.

From the transfer sheet or other equivalent member the design is transferred or printed on to a plate of suitable metal as, for instance, zinc or aluminum, to which ink may be applied, and thereafter transferred to what may be termed broadly a printing member of elastic material, as, for instance, rubber, from which the finished picture or design is printed. To those skilled in the art it will be understood that the plate on to which the design or picture has been transferred or printed and to which the ink is applied is of such a character that the ink will adhere to that portion only which bears the said design or picture; and also that the amount of ink which will adhere thereto or be deposited thereon from the inking rolls or other source of ink supply will be equal to that which may be deposited from the transfer sheet and will in fact be a reproduction of the lights and shadows or contrasts of the design as they appear on the transfer sheet. As the ink

deposited on the plate is transferred to and deposited on the elastic printing member from which the picture or design is printed it will be understood that the lights and shadows or contrasts of the picture or design as they appear on the transfer sheet will be reproduced in the finished printed picture or design.

In the actual practice of my process, I transfer the picture or design from a transfer sheet to a zinc plate and thereafter secure said plate in position around the cylinder of an offset press which is provided with inking mechanism for applying the ink to the said plate. As previously stated, the ink adheres only to that portion of the plate carrying the design. The cylinder is rotated and the portion of the plate bearing the design contacts with the offset cylinder of elastic material such as rubber, which may or may not be vulcanized. The paper or stock on to which the picture is to be printed is brought by suitable mechanism into contact with the said rubber offset cylinder from which the said picture is printed. It may be stated here that in carrying out my process as above stated the design for the picture as etched into the plate is positive and that when the same is transferred or printed on to the transfer sheet it is reversed or is negative and consequently it appears upon the zinc plate in positive or correct position and in being transferred or printed on to the offset cylinder is again reversed so that the finished picture is correctly printed on the paper. It will, of course, be understood that whether the picture or design should be etched or otherwise formed as a positive on the plate will depend upon the number of transfers which are made before the final transfer to the elastic printing member.

For the purpose of assisting in a clear and comprehensive understanding of my invention, drawings have been prepared, and accompany this specification, in which the essential steps of my process, which has been previously described herein, are illustrated. No attempt is made in such drawings to illustrate in their entirety the mechanical devices employed in the practicing or carrying out of my invention.

In the drawings:—Figure 1 is a longitudinal section of mechanism by means of which a proof is taken from a half-tone intaglio plate by means of a transfer sheet; Fig. 2 is a similar view of mechanism by means of which the design is transferred from the transfer sheet to a metallic sheet or plate or its equivalent; and Fig. 3 is an end elevation of portions of an offset press or a similar press employed in carrying out the final step of my process.

Referring to the drawings, 1 designates a base or bed plate upon which is supported a suitable block 2 of any suitable material. As one of the materials which may be used may be mentioned stone.

3 designates the etched plate previously prepared in a known manner as hereinbefore set forth.

4 designates the transfer sheet which is laid directly on to the plate 3 and 5 designates a protecting sheet, such as cardboard, which is laid upon the transfer sheet.

6 designates a pressure member having a facing 7 secured thereto which is adapted to contact with the protecting sheet of cardboard 5.

In practice the ink is placed in the cavities formed in the plate 3 after which it is placed upon the block 2 and thereafter the transfer sheet 4 and protecting sheet 5 are laid upon the plate. After this has been done the bed plate 1 together with the block 2 and the parts supported thereon are caused to travel under the press 6, the transfer sheet being thus pressed down upon the plate 3 and the ink from the cavities in the said plate being deposited on to the said transfer sheet. The transfer sheet is then removed from the plate 3 and is deposited upon the metallic plate or sheet 10, which is supported upon a suitable base or bed plate 11 which is adapted to travel or to be moved underneath the pressure member 12 having a facing 13 of suitable material such as leather. The plate 10 may consist of any suitable material, such as zinc or aluminum or their equivalent. It will be understood that the side of the transfer sheet containing the ink is placed against the sheet 10. After having placed the sheet 4 upon the metallic plate 10 a protecting sheet of cardboard or similar material 15 is placed upon the said transfer sheet 4. This having been done the base or bed plate 11 is moved forward by any suitable mechanism underneath the pressure member 12 with the facing or contact portion 13 thereof in contact with the protecting sheet of cardboard 15. The pressure member 12 exerts a considerable pressure upon the sheets 15, 4 and 10 and causes a deposit of the ink design from the transfer sheet on to the metal plate 10, the latter plate having been previously treated or prepared in a known manner.

The design having been transferred from the transfer sheet 4 to the metallic plate 10, as stated, the latter is then removed and applied to a cylinder 20 of an offset or similar press in a known manner. Ink is applied to the surface of the said cylinder by means of inking rolls 21. By reason of previous treatment the surface of the metallic plate 10 upon the cylinder 20 is of such nature or character that the ink from the rolls 21 adheres only to that portion thereof to which the design from the transfer sheet 4 has been applied. The cylinder 20

coöperates with the cylinder 22 provided with a covering 23 of a suitable elastic material, which in the construction shown consists of a sheet of fabric having an outside facing of rubber. The ink is transferred from the cylinder 20 to the elastic covering of the cylinder 22. The cylinder 22 coöperates with an impression cylinder 24. The latter cylinder is associated with gripping devices 25 which are adapted to grip the forward edges of sheets of paper 26 and carry the said sheets between the surfaces of the cylinders 22 and 24. The design transferred from the cylinder 20 to the cylinder 22 is printed from the latter on to the sheets of paper 26 as they successively pass between the cylinders 22 and 24.

The mechanism for supporting and feeding the sheets of paper to the press is not shown, but it is to be understood that any suitable mechanism now in use or which may hereafter be brought into use may be employed for that purpose.

It is to be understood that my process is not dependent upon a "blanket" or cylinder of rubber, but such "blanket" or cylinder may consist of any equivalent elastic material. The use of an elastic "blanket" or cylinder, that is to say, an elastic printing member, which is able to conform to the inequalities and roughened surface of the paper or stock being printed upon, enables the production of a picture having the depth of color desired and in which the said color effect is correct.

Having thus described my invention, I claim:—

1. The process of reproducing a design from a half-tone intaglio printing plate which consists in printing the said design from the said plate on to a transfer member, transferring the said design from the said transfer member to a suitable metallic plate, thereafter depositing ink on said design on said metallic plate, the ink being of a depth or quantity to reproduce exactly the lights and shades of the design on said transfer member, and transferring the ink so deposited upon the said design from the said plate on to an elastic member to form the said design on said elastic member, and printing the finished design from the said elastic member.

2. The process of reproducing a design from a half-tone intaglio printing plate which consists in printing the said design from the said plate on to a transfer member, transferring the said design from the said transfer member to a suitable metallic plate, depositing ink from the said design on the said plate on to an elastic member, and printing the finished design from the said elastic member.

3. The process of reproducing a design from a half-tone intaglio printing plate which consists in printing the said design from the said plate on to a sheet of transfer paper, transferring the said design from the said transfer sheet to a suitable metallic member, depositing ink from the said design on the said member on to an elastic non-metallic member, and printing the finished design from the said member.

4. The process of printing a design or picture which consists in the making of a half-tone intaglio printing plate, placing a suitable ink in the cavities in the said plate, printing the design or picture on to a sheet of transfer paper, transferring the design or picture to a suitable metallic member, printing the said design or picture from the said metallic member on to a non-metallic elastic member, and printing the finished design or picture from the said member.

5. The process of printing a design or picture from a half-tone intaglio plate which consists in placing a suitable ink in the cavities of the said plate, applying a transfer sheet to the said plate and transferring the ink from the said cavities to the said sheet, transferring the ink forming the said design or picture from the said transfer sheet to a suitable metallic plate, such as zinc or aluminum, applying a suitable ink to the said design or picture on the said plate and making an offset impression of the same on the elastic cylinder of an offset press, and printing the finished design or picture from the said elastic cylinder.

6. The process of reproducing a design from a half-tone intaglio plate which consists in transferring the said design from the said plate to the surface of an inelastic member, applying ink to the design on the said member, depositing the ink from said member on to an elastic printing member, and printing the said design from the said elastic printing member.

7. The process of reproducing a design from a half-tone intaglio plate which consists in printing the said design from the said plate on to a transfer sheet, transferring the said design from the transfer sheet to a suitably prepared design receiving member, applying ink to the design on the last mentioned member, depositing the same from the said last mentioned member on to an elastic printing member, and printing the finished design from the said elastic printing member.

8. The process of reproducing a design or picture from a half-tone intaglio plate which consists in transferring the said design from the said plate to the surface of an inelastic member, thereafter successively applying ink to the design on the said member, the portion of the said member where the design is situated being adapted to receive and retain the ink necessary to reproduce the lights and shadows or contrasts of the

design transferred thereto from the said intaglio plate, depositing the ink from the said member on to an elastic printing member, and printing said design or picture from the said elastic printing member.

In testimony that I claim the foregoing as my invention, I have hereunto signed my name this 23rd day of November, A. D 1909.

EDWARD LAWRENCE FELL.

In the presence of—
CARRIE E. KLEINFELDER,
JOHN H. HALL.