# United States Patent Office.

GEORGE T. JONES, OF CINCINNATI, OHIO.

*Letters Patent No.* 66,500, *dated July* 9, 1867.

## PROCESS FOR MANUFACTURING BANK NOTES, &c.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, GEORGE T. JONES, of Cincinnati, in the county of Hamilton, and State of Ohio, have invented a new and improved Process for Manufacturing Bank Notes, Bonds, and analogous securities; and I declare that the following is a sufficiently full, clear, and exact description thereof to enable one skilled in the art to which my invention appertains to carry the same into effect.

The primary object of my invention is to prevent danger of counterfeiting, either by photography, or by the transfer of the print. For this purpose I employ, in combination, the two different processes known as "surface" and "plate" printing, the first being adapted for the application of delicate and brilliant colors, which, owing to the lack of body or consistency in their materials, cannot be successfully used in plate printing, and the latter being required for taking impressions of line engravings.

The second essential feature of my combined process is the printing directly upon the body of the paper before sizing, so as to cause the ink and coloring matter to penetrate and come in actual contact with the fibres of the paper.

The third feature is the subsequent covering and securing the print impression or written characters with a coating of size, which, permeating the body of the paper and the ink, affords strength to the former, and prevents the transferring of the latter.

The fourth feature is the use of inks of such colors or combination of colors as to render impossible the copying of the notes, &c., by any known process of photography

In carrying out my invention I print upon unsized paper, by the surface or letter-press process, with various colors, such as carmine, lake, chrome-green, madder-red, ultramarine, or any of them, or others, which, by reason of the soft consistency of their materials, or from other causes, are not adapted for plate printing. Either before or after the said surface printing, the line engravings or other work which require it are printed by the plate process with black carbon ink in customary manner. By printing directly upon the paper before the application of size, I am enabled to produce much more clear and sharp impressions, and the ink and coloring matter are caused to penetrate the body of the paper and, by coming into actual contact with its fibres, are made more permanent and secure than if applied to sized paper. After the completion of the two printing operations, I treat the paper with a compound size, which permeates the entire body of the paper and of the inks, imparts great strength and durability to the paper, and being insoluble in either acid, alkali, or water, makes it impossible to transfer the prints or remove them in any manner without destroying the bank note or other document under treatment. The size for this purpose may be variously made, but the following compound has been found to operate with good success: animal albumen, twenty parts; gum tragacanth, two parts; silicate of soda or potash, one part, the paper being heated (by passage between calendar rollers or by any other suitable means) to from 150° to 200°, to solidify the size.

I am aware that some of the features of my combined process, and possibly all the separate elements thereof, (with the exception of a size, which, by being solidified by heat, may not be again dissolved,) may have been before practised or known; but taken separately no part of the process is fully effective for the prevention of counterfeiting by one or other of the modes used for that purpose.

The advantages of my combined process may be summed up as follows:

First. I print entirely upon unsized paper, thereby securing the accuracy and beauty of the original engraving, the same as now exhibited only by India-proof impressions. In using colors, even the most delicate inks are available, with all the consistency required to give brilliancy and durability; and without sizing of the paper these inks are absorbed and become an integral part of the paper fabric.

Second. By these improvements the finest work of the geometrical lathe and medallion ruling is first reproduced in the form of male plates, for surface printing upon unsized paper, as proposed by this new process. This enables us to use the carmine and other delicate tints, and protect them from wear by handling, through the double process of absorption in printing, and subsequently sizing and calendering, to give a smooth surface over all the various inks employed. If the colors used by this process are anti-photographic, as they can be, the liability to imitation by that art is thereby entirely avoided.

Third. The process of printing upon unsized paper by this new method admits of the use of all inks to the

best advantage for effect and permanency, as the two processes of printing from male and female plates, as proposed, enable us to use each and every color, as they may be best adapted to the one or the other mode of printing.

Fourth. By the improved method, as proposed, I dispense with nothing valuable in the present mode of production, while I secure a range of application in the inks and colors which can only be made available by the two processes of male and female printing, and by using always unsized paper in printing. All the excellence of the best devices and engravings can be exhibited so as to preserve the original integrity and beauty of artistic designs of every description, and, for the first time in the history of this important art, I unite artistically all the advantages of the combined use of plates and surface printing, protected by subsequent sizing of the paper.

Fifth. By the size being composed of ingredients which, after being solidified by heat, may not be again dissolved, its removal is rendered impossible.

Sixth. The sizing and calendering of the notes subsequently to printing puts the ink entirely out of reach, and thus effectually prevents electrotyping from an impression.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

The combined process, herein described, for producing bank notes or other securities by plate and surface printing at separate operations and with various colors on unsized paper, and subsequently perfecting the paper and locking up the prints therein by the application of size which is subsequently rendered insoluble by heat.

GEO. T. JONES.

Witnesses:

OCTAVIUS KNIGHT,

J. E. M. BOWEN.