

H. W. F. LORENZ.
SENSITIVE SAFETY PRINT AND PROCESS.
APPLICATION FILED NOV. 17, 1909.

967,793.

Patented Aug. 16, 1910.

FIG. 1.

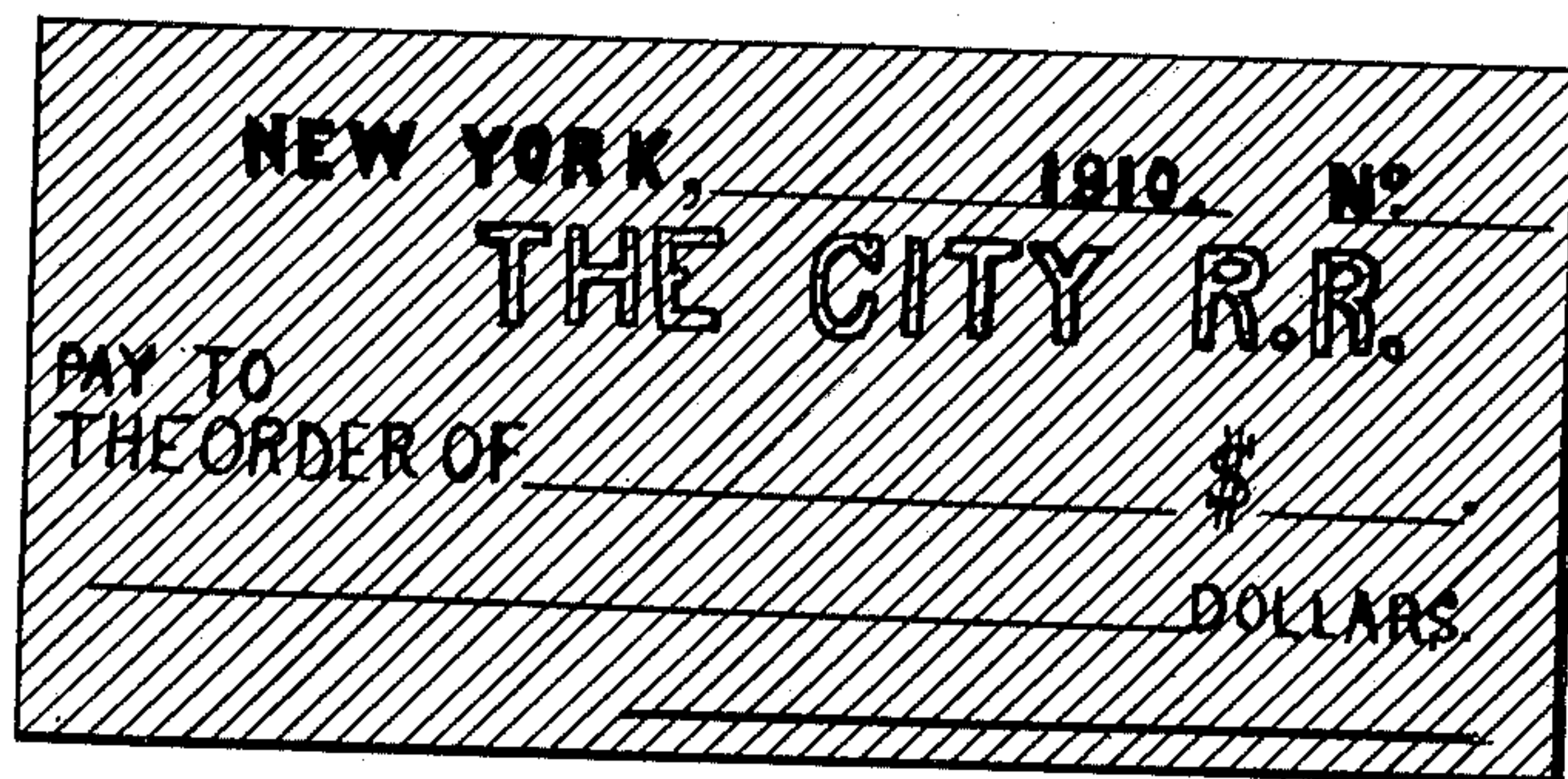
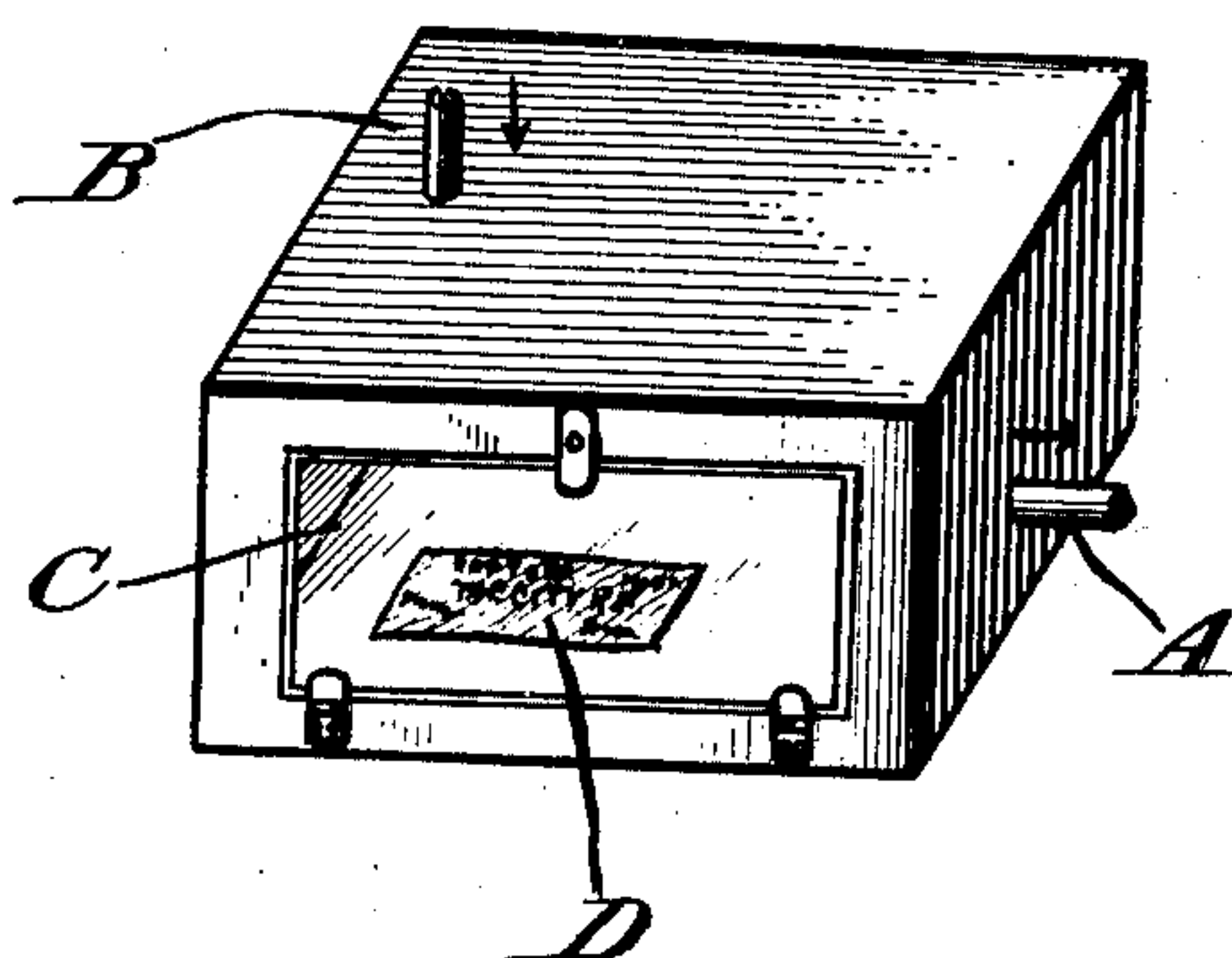


FIG. 2.



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SENSITIVE SAFETY-PRINT AND PROCESS.

967,793.

Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed November 17, 1909. Serial No. 528,565.

To all whom it may concern:

Be it known that I, HENRY W. F. LORENZ, a citizen of the United States, and a resident of the city of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and Improved Sensitive Safety-Print and Process, of which the following is a clear, full, and exact description.

This invention relates to the manufacture of sensitive safety prints such as are intended to be used for checks, letters of credit, bank notes, postage stamps, revenue stamps, bonds, stock certificates, and the like security papers.

In my application No. 490,386 I have disclosed a sensitive safety print and process for making the same. The chief characteristic in the cited application is that a soluble, chemically sensitive, coloring matter in the finished print is converted into a water-insoluble coloring matter. Furthermore, I have disclosed also the fact that, in the case of a printing ink for engraved plates, an ink base like blanc fixe, sublimed lead, etc., should preferably be present to give the ink proper working qualities.

In the present application I disclose and claim a sensitive safety print and process in which, first, an insoluble as well as a soluble sensitive coloring matter can be fixed firmly and insolubly upon the paper surface in the finished print. Secondly, larger quantities of an ink base, like blanc fixe, lime carbonate (paris white), etc. can be used. This also is a desideratum in many cases.

In carrying out my invention I make use of the following substances, or proper combinations of the same. A water soluble sensitive color (direct dyeing cotton colors, basic colors, etc.), or an insoluble sensitive color or color lake. (A colorless sensitive substance, soluble or insoluble, sensitive to dilute reagents, *e. g.*, phenolphthaleine, etc., may be added to the color, or colors, used; or it may be employed by itself, *i. e.* in this case we would obtain a colorless sensitive ink.) An ink base, or ink bases, like blanc fixe, etc., lime carbonate, starch or other substance suitable for a like purpose. An ink vehicle containing, as principal ingredient, a coagulable substance, *e. g.*, albumen, casein, gelatin, or like substance.

Reference is to be had to the accompany-

ing drawings which form a part of this specification.

Figure 1 represents a check which is made according to my invention, being printed with my special sensitive ink. Fig. 2 shows a simple form of closed receptacle, or steaming box, into which steam enters at (B) and passes out at (A). (C) represents a removable glass door through which can be seen the check (D) being subjected to steam vapor.

To carry out my invention I may proceed in several ways, depending principally upon the nature of the coagulable substance employed in the ink. For instance when using albumen, I prefer to proceed as follows:

Albumen vehicle, or varnish.—Treat parts of egg albumen with 20 parts of water. Let stand, stirring occasionally, until a homogeneous mass is obtained. To the latter add 20 parts of glycerin and stir until the same is mixed thoroughly. This varnish can be thinned with more glycerin, if desired.

Examples of various inks containing this vehicle:

(1) Take mimosa Y. C. (Geigy) $C_{28}H_{19}N_5S_4O_6Na_2$, 25 parts and dissolve in glycerin, 56 parts. Add to this mixture paris white, 55 parts. Bring the resultant pasty mass upon the ink mill and grind thoroughly. Now add albumen varnish, 90 parts. Pass repeatedly through the mill, thinning with glycerin until about 48 parts of the latter have been used, when the ink will be found to have the right consistency for printing. Make a print and expose to steam vapor. Color of print: yellow. Reactions: solutions of oxalic acid: orange color; bleaching powder: purple color, finally bleached.

(2) Mix mimosa Y. C. lake (insoluble), 25 parts with albumen varnish 30 parts. Print and expose the print to steam vapor, or simply heat print to a sufficiently high temperature to coagulate the albumen and evaporate the glycerin. Color and reactions same as above.

(3) Benzopurpurin ($C_{34}H_{26}N_6O_6S_2Na_2$) 20 parts; phenolphthaleine ($C_{20}H_{14}O_4$) 5 parts; albumen varnish 30 parts. Print and expose the print to steam vapor. Color: red. Reactions: solutions of oxalic acid: blue black; alkalis: red; bleaching powder: gradually bleached.

(4) Invisible ink. Phenolphthaleine, 20 parts; albumen varnish, 25 parts. Reactions: solutions of alkalis: red.

(5) Congo red, 10. ($C_{22}H_{22}N_6O_6S_2Na_2$); 5 paris white, 80; albumen varnish, 90; glycerin, 80; color: red. Reactions: solutions of oxalic acid: blue; alkalis: red-brown, soluble; bleaching powder: red, slowly bleached.

10 It will be noted that instead of the albumen varnish similar varnishes of a coagulable nature can be used; for instance a casein varnish: casein dissolved in a borax solution with addition of glycerin; or a gelatin varnish can be employed: gelatin dissolved in water with addition of glycerin. 15 The gelatin contained in an ink made with this vehicle can be coagulated by exposing the print to steam vapor containing formaldehyde vapors. 20

For a plate ink it is advisable to add a percentage of gum tragacanth or gum trigura. For instance add to ink (1) about 20% of the following mixtures, A or B:— 25 A. Digest gum tragacanth, 50 parts with water 400 parts. B. Digest gum trigura, 20 parts, with water, 90 parts. The reason for this addition to the ink for steel plate printing is to give the ink better wiping 30 qualities.

I claim:

1. The process of making a sensitive print on paper, which consists in taking a soluble, chemically sensitive coloring matter capable 35 of being converted into a water insoluble body, adding a water soluble vehicle containing a coagulable substance as principal ingredient, printing therewith and exposing the print to steam vapor.

40 2. The process of making a sensitive print on paper which consists in taking a soluble, chemically sensitive coloring matter capable of being converted into a water insoluble body, adding an inert base and a water 45 soluble vehicle containing a coagulable sub-

stance as principal ingredient, printing therewith and exposing the print to steam vapor.

3. The process of making a sensitive print on paper which consists in taking a chemically sensitive insoluble coloring matter, adding a water soluble vehicle containing a coagulable substance as principal ingredient, printing therewith and heating the print to a temperature sufficiently high to coagulate 55 said coagulable substance.

4. The process of making a sensitive print on paper which consists in taking a chemically sensitive, insoluble, coloring matter, adding a water soluble vehicle containing 60 a coagulable substance as principal ingredient, and an inert ink base, and exposing the print to steam vapor.

5. The process of printing on paper with a chemically sensitive ink containing a coagulable substance as one of the ingredients, and fixing the ink on the paper by coagulating said coagulable substance. 65

6. As a new article of manufacture, a safety print formed of a suitable carrier 70 having thereon an ink base, a coagulable substance and a chemically sensitive water-insoluble substance incorporated in said ink base.

7. A sensitive safety print comprising a 75 paper body adapted to receive writing ink printed with a coagulable printing ink embodying therein, as principal ingredients, a coagulable substance and chemically sensitive color pigments varying in quantity,— 80 to prevent the removal of writing ink without destroying, or changing the color, of said color pigments.

In testimony whereof I have signed my name to this specification in the presence of 85 two subscribing witnesses.

HENRY W. F. LORENZ.

Witnesses:

WM. INNES,
MARIE LORENZ.