

No. 735,854.

PATENTED AUG. 11, 1903.

A. VON BEUST.

PROCESS OF MAKING MULTICOLOR PRINTING SURFACES.

APPLICATION FILED NOV. 19, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

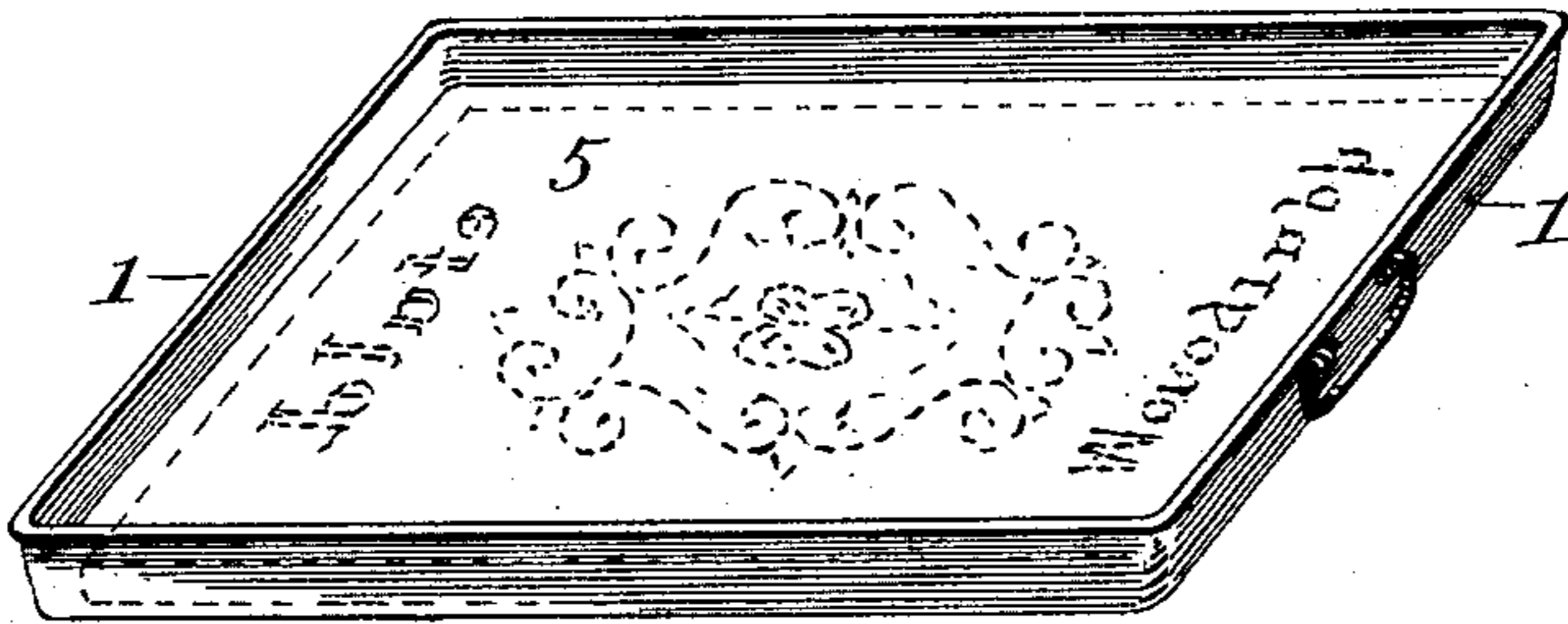


Fig. 2.

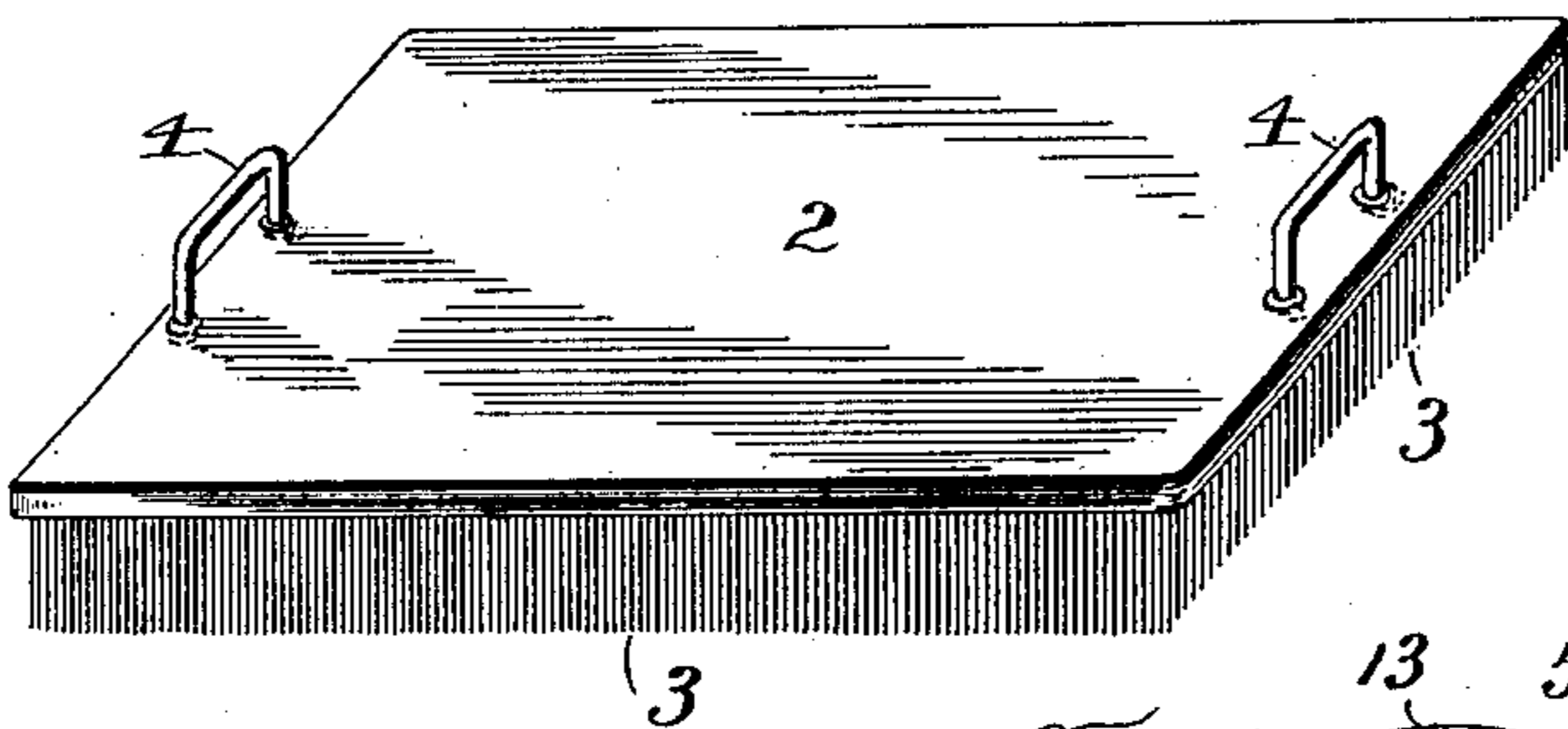


Fig. 3.

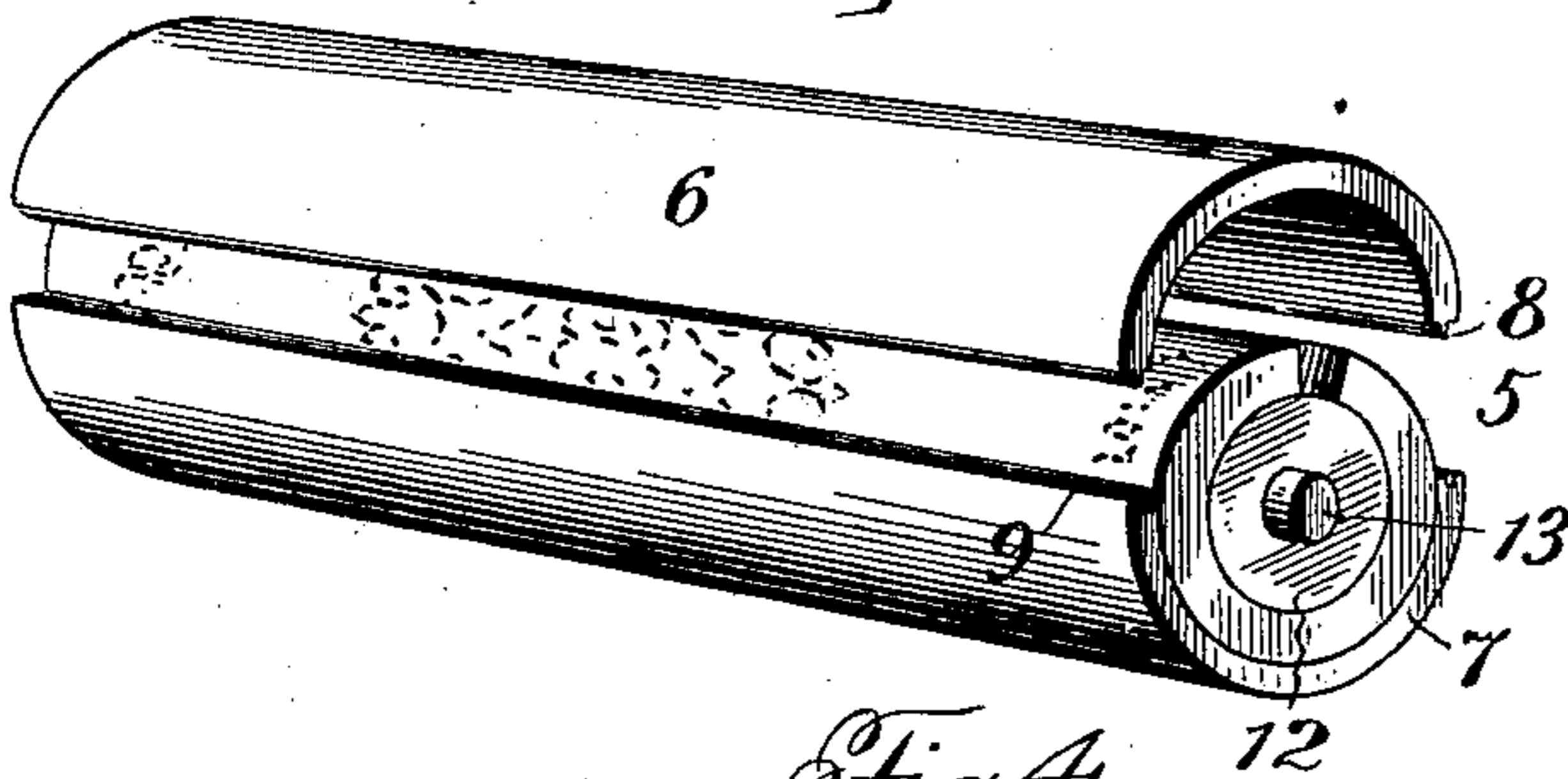


Fig. 4.

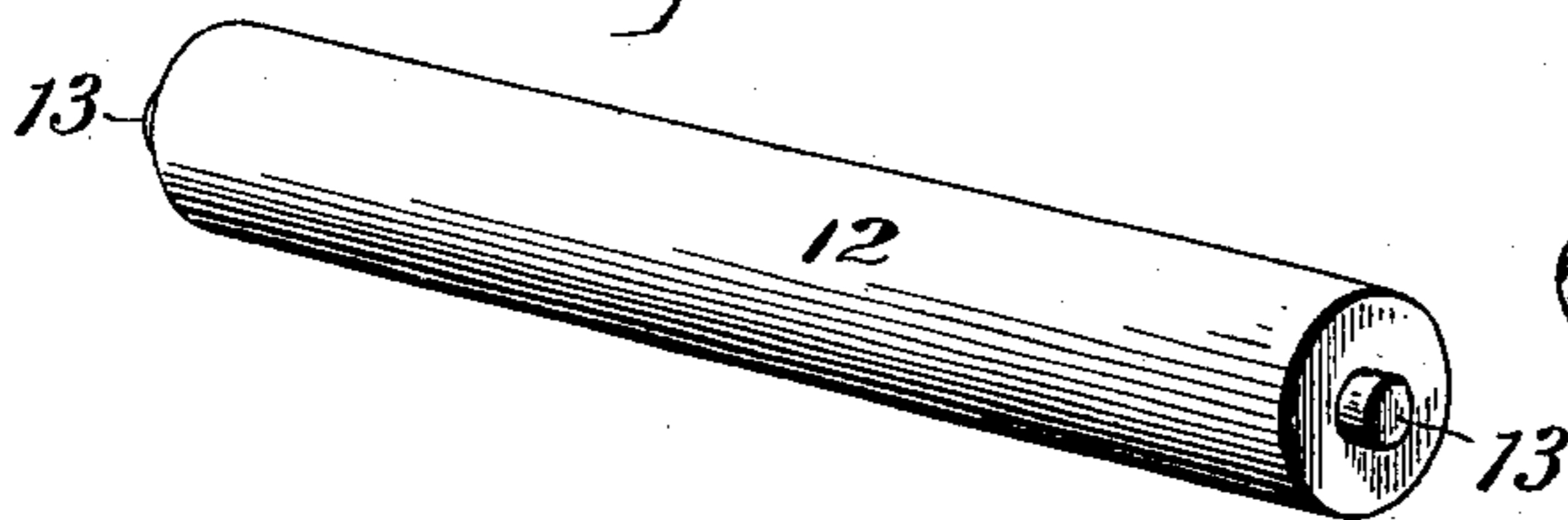


Fig. 5.

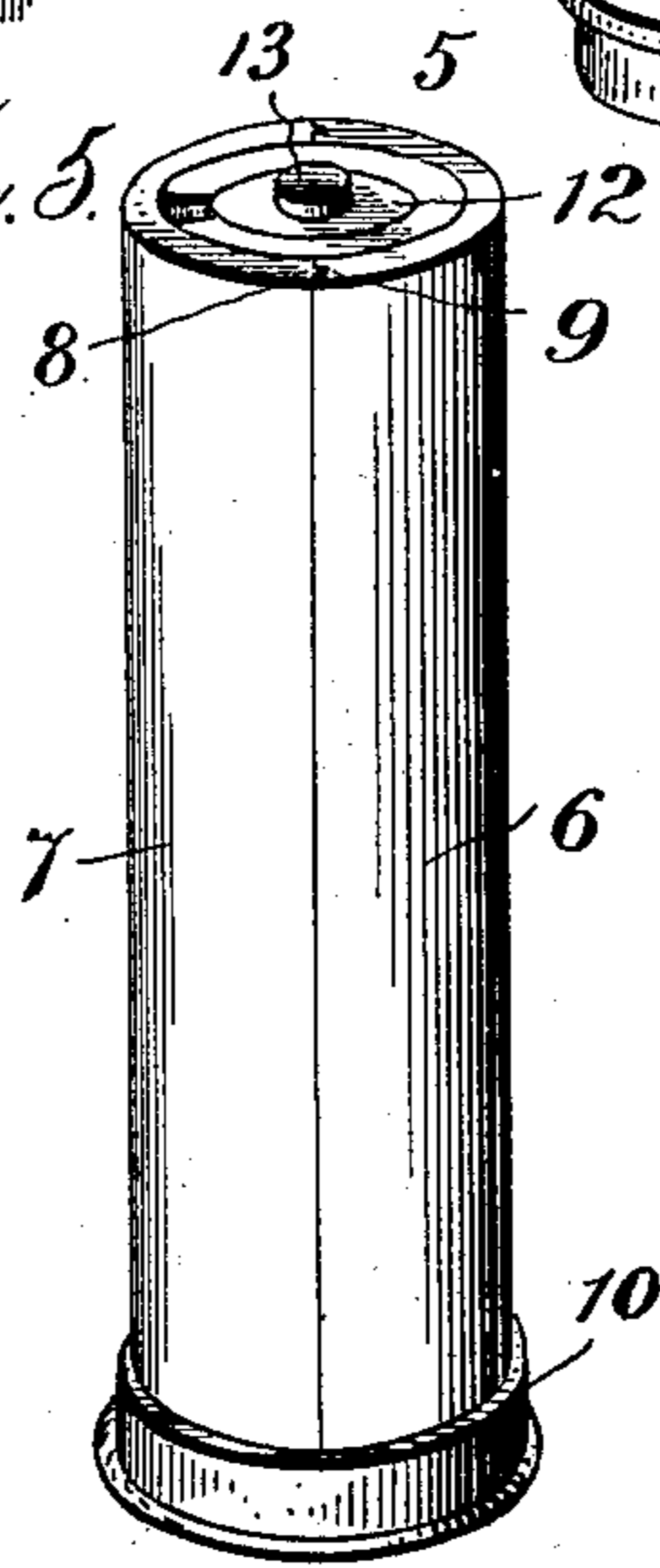
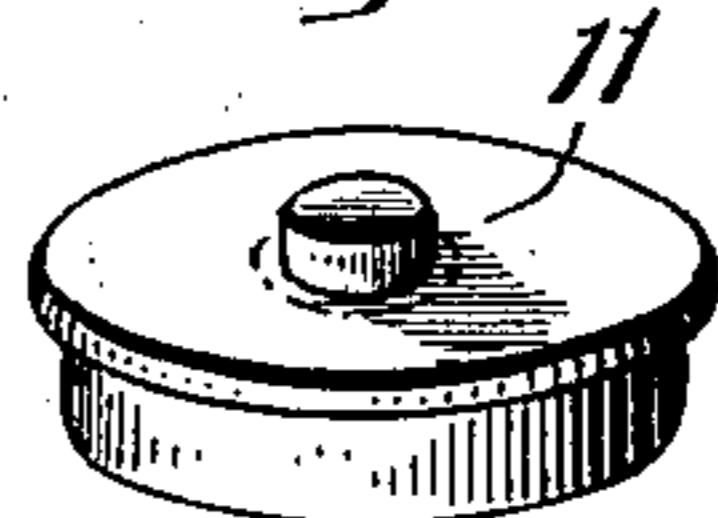


Fig. 6.



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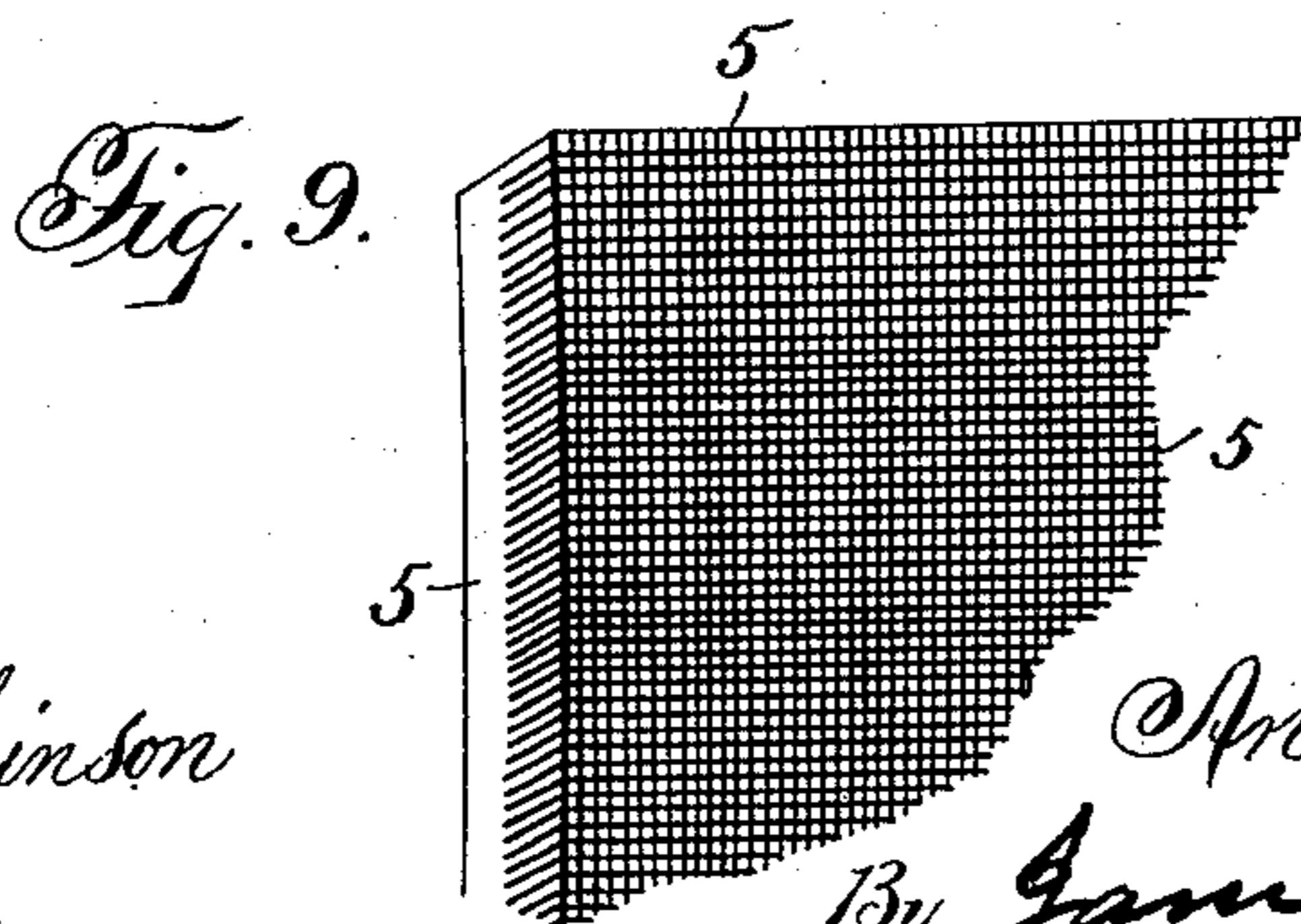
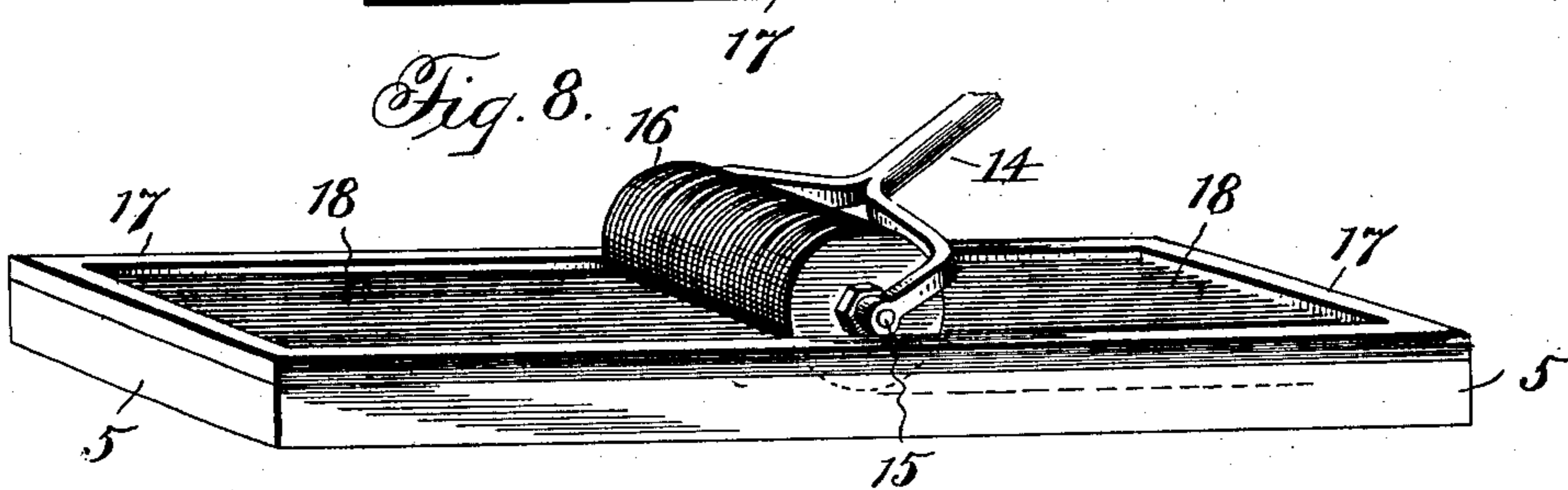
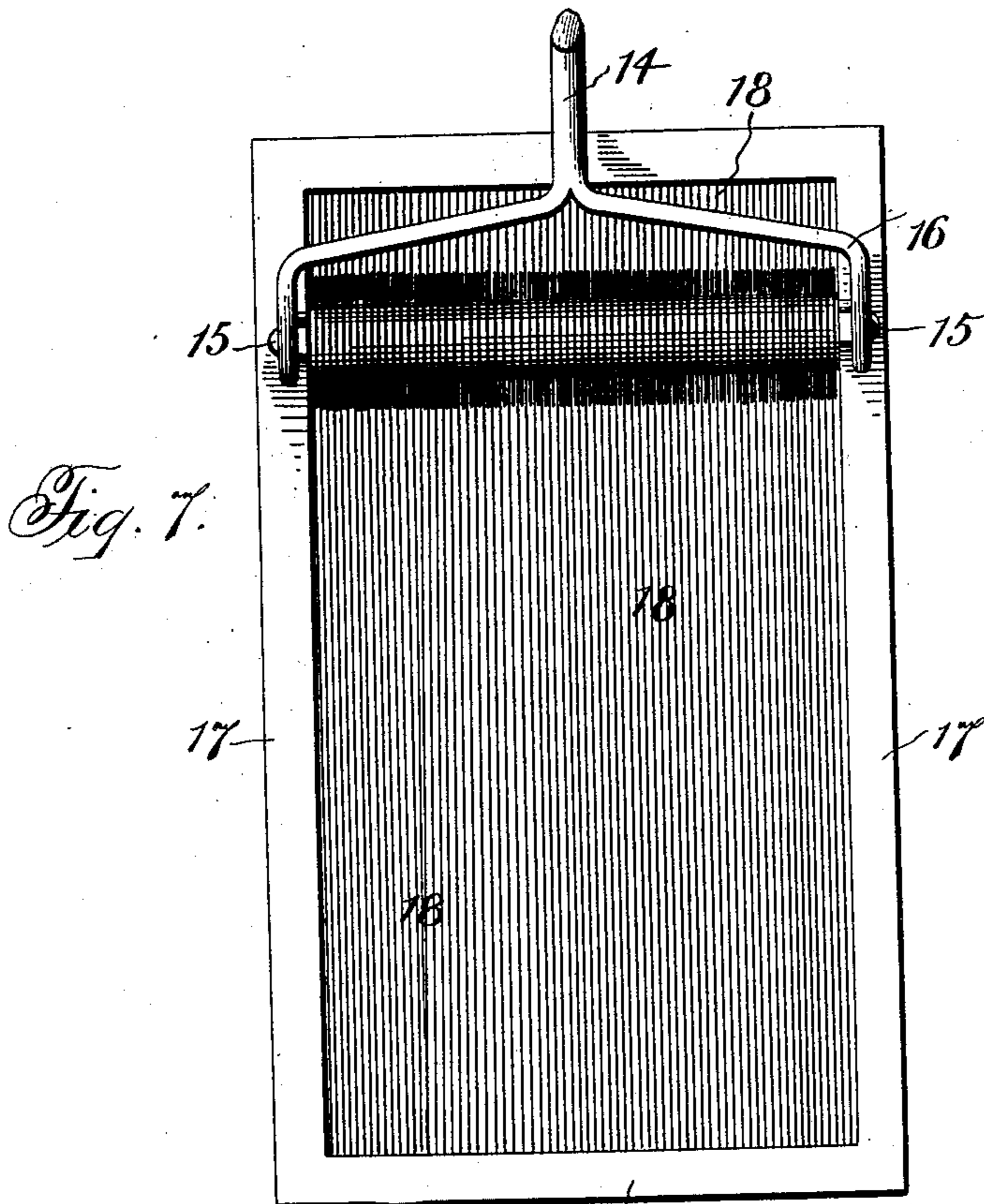
A. VON BEUST.

PROCESS OF MAKING MULTICOLOR PRINTING SURFACES.

APPLICATION FILED NOV. 19, 1902.

2 SHEETS—SHEET 2.

NO MODEL.



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UNITED STATES PATENT OFFICE.

ANTON VON BEUST, OF ORANGE, NEW JERSEY.

PROCESS OF MAKING MULTICOLOR-PRINTING SURFACES.

SPECIFICATION forming part of Letters Patent No. 735,854, dated August 11, 1903.

Application filed November 19, 1902. Serial No. 131,988. (No specimens.)

To all whom it may concern:

Be it known that I, ANTON VON BEUST, a citizen of the United States, residing at Orange, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Processes of Making Multicolor-Printing Surfaces, of which the following is a specification.

This invention relates to an improved process for making printing-surfaces, and especially to printing-surfaces for making marbled paper for decorating walls and the like and for producing ornamental effects of various different kinds on a glutinous printing-surface that is adapted for contact printing.

It also relates to the improved printing-surface made by the improved process.

To these ends my invention consists in the improved printing-surface and the improved process of making the same, as hereinafter described, and particularly pointed out in the claims following the description, reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a perspective view of a tray for molding a flat composition sheet, the painted layer or coating being shown in the bottom of the tray. Fig. 2 is a perspective view of the wire brush employed for puncturing the composition plate. Fig. 3 is a similar view of the sectional cylinder for molding the plate in roller form, the two sections of the cylinder being shown slightly separated. Fig. 4 is a detailed perspective view of the core or mandrel. Fig. 5 is a similar view of the sectional cylinder, one of the caps being removed and the core and roller being shown in place in the cylinder. Fig. 6 is a perspective view of one of the caps. Fig. 7 is a plan view of a modified implement for puncturing the composition sheet. Fig. 8 is a perspective view thereof, and Fig. 9 is a perspective view of a portion of the composition sheet after it has been operated on by said modified implement.

In making an impression-plate according to my invention I first make a gelatinous, viscous, or glutinous mass or mixture from any material suitable for the purpose. For example, I mix together glue or gelatin, soap, glycerin, and oil of cloves and warm the com-

pound in a water-bath in a well-known manner. I then take a tray or pan of a suitable size—such, for example, as indicated by the numeral 1 in Fig. 1 of the drawings—and coat the bottom of such pan or tray with a thin layer of the mixture above described while in a warm condition and permit the layer or coating to cool. Then with suitable dyes, pigments, or anilin colors, preferably mixed with glycerin or the like, I paint the picture, design, or whatever the ornamental subject is which it is proposed to reproduce by printing on the layer in the bottom of the tray and permit the painting to dry. After the painting has become perfectly dry I cover it with a thin sheet or coating of the glutinous composition above described, and before applying such coating it is previously cooled in order to prevent blurring, after which is poured a sufficient quantity of the said composition in a warm state over the whole and to a depth sufficient to make a plate of the desired thickness, and the entire mass is then allowed to cool and stiffen. With a suitable instrument I then form in the composition plate constructed as above described innumerable minute incisions that extend from the top of the composition plate as it lies in the tray transversely down through said plate nearly to the bottom of the tray, or, in other words, down to the painted part of the plate near the bottom of the tray, and said incisions may be conveniently, rapidly, and accurately formed by means of the implement shown in Fig. 2 of the drawing and which I will now describe.

Referring to Fig. 2 of the drawings, the reference-numeral 2 indicates a brush-back, which is preferably formed of a material which is slightly elastic—such as leather, rawhide, rubber, or the like—and inserted in said brush-back is a plurality of bristles 3, preferably formed of wire, said bristles being of a length sufficient to pass at least entirely through the composition plate molded in the tray before referred to. The bristles are set very close together and are preferably about one sixty-fourth of an inch in diameter. After the composition plate has been formed in the manner before described the bristles are oiled or greased and are also warmed, after which the brush is placed on top of the com-

position plate, the ends of the bristles resting on the upper surface of the plate, and by means of handles 4 the brush is pressed down upon the plate, so as to cause the bristles to
 5 puncture or honeycomb the plate and to such a depth that the bristles will puncture to or near to the bottom of the pan, or, in other words, will at least puncture to the painted bottom portion of the composition plate. The
 10 bristles are allowed to remain in the compound until they become cool, when the brush is withdrawn. This leaves the composition plate remaining in the tray and honeycombed or punctured to a point in close proximity to
 15 its bottom. The top of the plate is now covered with alcohol or citric acid in solution or other fluid material which operates to dissolve the anilin colors readily. After all the punctures have been filled with the dissolving fluid
 20 the plate is allowed to stand for some time to permit the color which forms the ornamental design near the bottom of the plate to dissolve and to rise through the punctures to the top of the plate by capillary attraction.
 25 After this result has been effected the tray is set level in a water-bath, just warm enough to sufficiently soften the composition plate to allow the punctures to close up and cause the plate to form once more a solid mass.
 30 Care should be taken that the water-bath will not be sufficiently warm to dissolve or melt the composition. When sufficiently cool, the mass or compound plate is removed from the tray and is then ready for printing.
 35 From this plate may be taken thousands of impressions on paper fabrics, oil-cloth, plastered walls, plaster-of-paris, wood, and numerous different materials, and the plate may be used to make duplicate impressions of the
 40 original colored design, faithfully reproducing all the colors in their proper relative positions until the plate has been wholly consumed.

Inasmuch as the plate constructed as above
 45 described is flexible, it may be readily constructed in the form of a roller or cylinder. In constructing it in cylindrical or roller form I proceed as follows: Reference being had to Figs. 3 to 6, inclusive, of the drawings,
 50 the numeral 5 indicates a sectional cylinder, which when the two sections are placed edge to edge, so as to register one with the other, form a complete hollow cylinder. The edges of one of the two longitudinal sections—as 6,
 55 for example—are provided with tongues 8 and the corresponding edges of the other section 7 are provided with grooves 9, the tongues and grooves matching or fitting one within the other when the two sections are assembled
 60 together. The numerals 10 and 11 indicate two caps, which are adapted to be fitted over and close the opposite ends of the sectional cylinder 5. The numeral 12 indicates a cylindrical core or mandrel, which is of less diameter
 65 than the inner diameter of the sectional cylinder 5, and said core is provided at its oppo-

site ends with gudgeons 13, which are adapted to form the journals of the core, as will more fully hereinafter appear.

After the composition plate has been constructed in the manner hereinbefore described
 70 it is placed in one of the sections of the cylinder—as 7, for example—and the core 12 is laid on top of the plate and pressed down onto said section until the plate closely con-
 75 forms to the lower half of the core 12 and the interior of the section 7, the inner side of such section having first been oiled or greased to prevent the plate from adhering thereto. In placing the plate in the section 7 it is dis-
 80 posed with its printing-surface toward the oiled surface of the cylinder, and after the core has been placed on the plate and said plate bent to conform thereto, as set forth, the two longitudinal edges of the plate are
 85 drawn toward the core and the other section 6 is placed over the plate and caused to register with the section 7, care being taken not to injure the printing-surface while doing so. On one end of the cylinder is now placed the
 90 cap 10, which is provided centrally with a socket to receive one of the gudgeons 13 of the core. The cylinder is next set up on end, after which the other cap 11 is fitted on the upper end of the cylinder. The cylinder is
 95 then warmed by steam or a water-bath or by any other suitable means, the temperature being raised just sufficiently to make the composition roller-plate inside the cylinder to slightly melt or to become sufficiently
 100 plastic to permit the mass to closely hug the inner surface of the cylinder, after which the cylinder and its contents are permitted to cool and the plate or roller to stiffen. After a sufficient time has elapsed to accomplish this
 105 result the sectional cylinder is peeled or stripped off the roller-composition plate, when the composition roller will be found in readiness for operation and may be employed to print from either by hand or by rolling it di-
 110 rectly over the surface to be printed upon, or the roller may be put in a cylindrical press or other press suitable for the purpose, and the material to be printed may be run through the press and receive the multicolored im-
 115 pressions. In forming the plate in the form of a roller or cylinder should the circumference of the plate prove to be smaller than the inner circumference of the cylinder, or if a margin is desired between adjacent prints
 120 that are to be made by the roller then the gap or space where the two edges of the plate fail to meet is filled with the compound hereinbefore described; but all color-matter is omitted from such compound, and the colorless com-
 125 pound is then warmed just enough to make it plastic and to flow readily between the two adjacent edges of the plate when the compound is poured therein. Care, however, should be taken not to sufficiently heat the
 130 filling compound to melt the edges of the plate. The caps are then placed on the ends

of the cylinder, and the latter is then warmed and subsequently cooled in the manner before described.

Instead of employing a wire brush to form the punctures in the plate I may employ a tool so constructed as to form slits in the plate, and I have illustrated a tool suitable for such a purpose in Figs. 7 and 8 of the drawings. As shown in said figures, the tool or instrument comprises a handle 14, bifurcated at one end and having journals in said forked end, and a rod or shaft 15, on which is rigidly fixed a series of thin and sharp metallic disks 16, which are set very closely together. In using the implement I mold in a flat tray—such, for example, as shown in Fig. 1 of the drawings—a compound gelatinous or glutinous mass, such as before described, and when said mass becomes stiff after cooling it is removed from the pan or tray and placed on a table or other flat support, the smooth side of the composition being disposed uppermost. On the upper side of the composition plate is then placed a metallic rectangular frame 17, to the opposite ends of which are attached the ends of parallel wires 18. Said wires are stretched taut, and each of the wires is preferably of a thickness equal to the space between any two of the circular knives or disks 16 of the tool or implement. The implement is then placed within the frame, the cutters extending between the wires, and the implement is moved along the composition plate, sufficient pressure being applied thereto to cause the knives to make long slits having a certain depth and equally distant one from the other. After this has been effected the frame 17 is removed and is again placed on the composition plate, but in a position at a right angle to the position it first occupied, and the tool or implement is again run over the plate to make a series of parallel slits, which extend at right angles to the slits before made. In practice both series of slits referred to are cut to such a depth that they will not quite extend through the entire thickness of the plate after the plate has been longitudinally and transversely slitted in the manner set forth. It is removed from the table and laid upon a slightly-convex surface to cause the fine slits on the surface of the plate to gap or slightly separate. On top of the slitted surface I now paint the desired design with anilin colors or dyes dissolved in alcohol. The colors will penetrate into every one of the cuts or incisions and will extend down to the lower ends of the latter in the bottom of the plate. When the painting is completed, the plate is again laid in its pan, wherein it accurately fits, and is then warmed slightly, which causes the mass to again assume the condition of a solid plate. While warm, care must be used not to move the tray, so as to prevent the mass from running together. When the plate becomes cool and stiff, it is then in readiness for printing innumerable impressions.

While I have described the plate as being formed from a composition comprising a mixture of glue or gelatin, soap, glycerin, and oil of cloves, I wish it to be distinctly understood that I do not confine myself to such compositions, as any glutinous, viscous, or gelatinous compound may be employed, provided it will possess the requisite flexibility after it has been molded into shape. For example, according to one method I proceed as follows: I soak six parts of glue in water for several hours and then pour off what water is not absorbed. To the glue I add three parts of glycerin which has been previously heated over a water-bath and constantly stir the mass while the glycerin is being added. To this mass is now added one part of pure castile soap which has been previously dissolved and warmed, and lastly is added enough of the oil of cloves to prevent decomposition. On the other hand, a very good composition can be made of nine parts of dry starch, one part of glycerin diluted in a small quantity of water, and a few drops of carbolic acid. This should be heated and stirred well. In preparing the anilin colors I proceed as follows, no proportions being stated for the reason that different colors will require different treatment, and the manner of treatment peculiar to each color can only be ascertained by experiment: As a rule I put a quantity of dry anilin color in a mortar and grind it up as fine as possible, and during the grinding operation I add a small quantity of alcohol, just sufficient to dissolve the color particles. I then add hot glycerin and continue the grinding until the color-paste is of the right consistency for painting. In some cases I have discovered that more alcohol must be employed than in other cases, and at such times I maintain the mass hot while grinding in order to cause the color to be thoroughly dissolved. Pigments and certain other color materials are ground on a slab or in a mortar with water and glycerin in a suitable quantity to make the mass in the form of a paste for painting, sufficient water or alcohol being used for thinning the mass when it is found necessary.

It will be obvious to those skilled in the art that various modifications in the different steps set forth in the method above described may be resorted to, and I do not wish to be understood as limiting myself to the exact methods of procedure hereinbefore described, excepting as may be hereinafter specifically set forth in the appended claims.

Having described my invention, what I claim is—

1. The process herein described of making printing-surfaces, consisting in coloring one side of a sheet of glutinous material, superposing a second sheet of glutinous material on said colored surface, and forming numerous punctures in said second sheet which extend through the latter and into the coloring material, and finally permitting the coloring

material to fill said punctures, in the manner specified.

2. The process herein described of making printing-surfaces, consisting in forming numerous penetrations in the surface of a flexible glutinous sheet, filling such penetrations with coloring materials in a definite manner to form a multicolored design in the body of the sheet, and warming the sheet to cause the penetrations to close up and form a solid sheet from which numerous impressions may be printed in the manner specified.

3. The process herein described of making printing-surfaces, consisting in painting on a thin layer of glutinous material a design in contrasting anilin colors, molding a relatively thick sheet of glutinous material on the said painted surface, puncturing said sheet with numerous minute perforations which extend through the sheet and into the coloring material, permitting the anilin colors to flow into and fill the perforations, and warming the mass thus formed sufficiently only to cause the puncture to close up and form a solid sheet, from which numerous impressions may be printed in the manner specified.

4. The process herein described of making printing-surfaces, consisting in painting on a thin layer of glutinous material a design in contrasting anilin colors, applying a thin coating of the glutinous material, while in a cool state, to the painted surface, molding a relatively thick sheet of glutinous material on said last-named coating, puncturing said sheet with numerous minute perforations, which extend through the sheet and into the coloring material, permitting the anilin colors to fall into and fill the perforations, and finally warming the mass thus formed sufficiently only to cause the punctures to close up and form a solid sheet on which numerous impressions may be printed in the manner specified.

5. The process herein described of making

printing-surfaces consisting in painting on a thin layer of glutinous material a design in contrasting anilin colors mixed with glycerin, molding a relatively thick sheet of glutinous material on said painted surface, puncturing said sheet with numerous minute perforations, which extend through the sheet and into the coloring material, permitting the anilin colors to flow into and fill the punctures, and warming the mass thus formed sufficiently only to cause the punctures to close up and form a solid sheet from which numerous impressions may be printed in the manner specified.

6. The process herein described of making printing-surfaces consisting in painting on a thin layer of glutinous material a design in anilin colors, molding a relatively thick sheet of glutinous material on said painted surface, puncturing said sheet with numerous minute perforations which extend through the sheet and into the anilin colors, filling perforations with a solvent to dissolve the anilin colors and cause the latter to flow into said perforations, and finally warming the mass thus formed sufficiently only to cause the punctures to close up and form a solid sheet from which numerous impressions may be printed in the manner specified.

7. The herein-described printing-surface comprising two superposed sheets of glutinous material, one of said sheets being coated on its inner side with a coloring material, and the other sheet being provided with numerous punctures which extend entirely therethrough and into the coloring material, whereby the punctures are filled with the coloring material, for the purpose specified.

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

ANTON VON BEUST.

Witnesses:

CALVIN W. GORDON,
WILLIAM R. MCKAY.