

No. 654,867

Patented July 31, 1900.

J. BAKER.

PROCESS OF PREPARING ETCHING GROUNDS.

(Application filed Nov. 15, 1897.)

(No Model.)

Fig. 1.

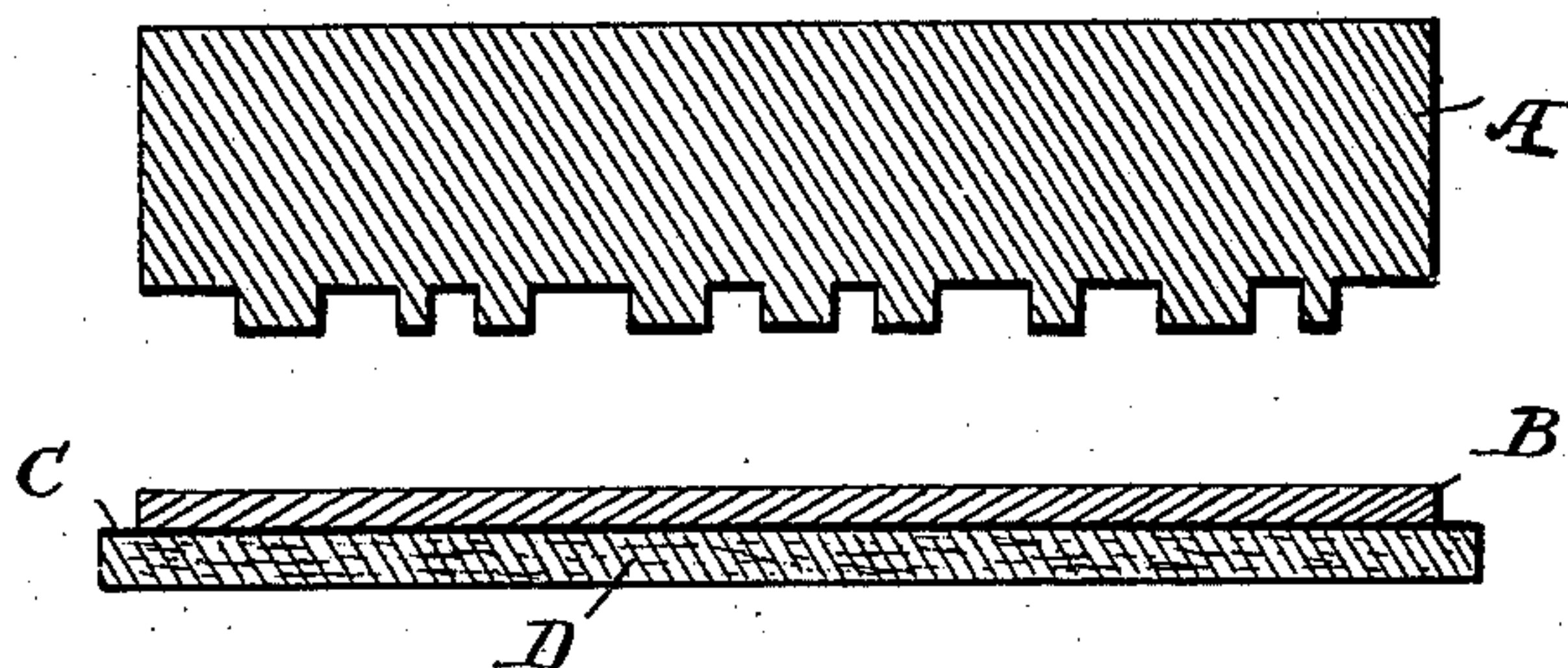


Fig. 2.

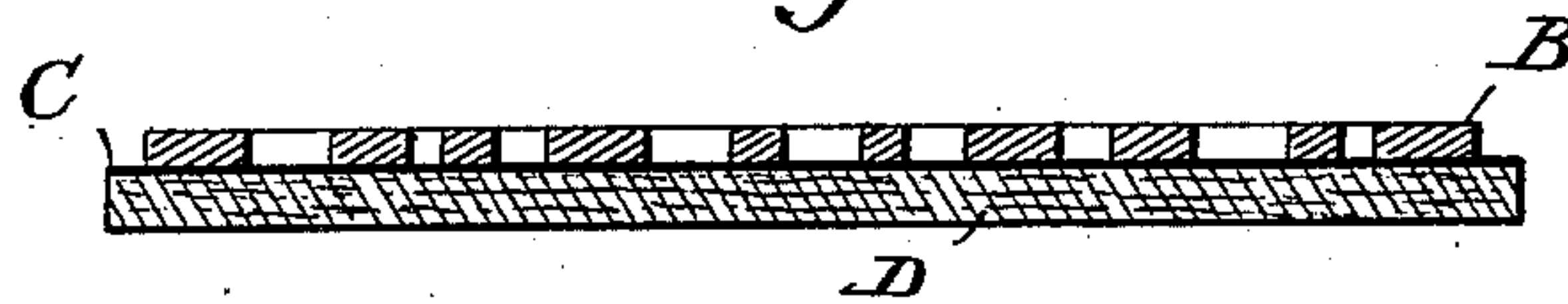


Fig. 3.

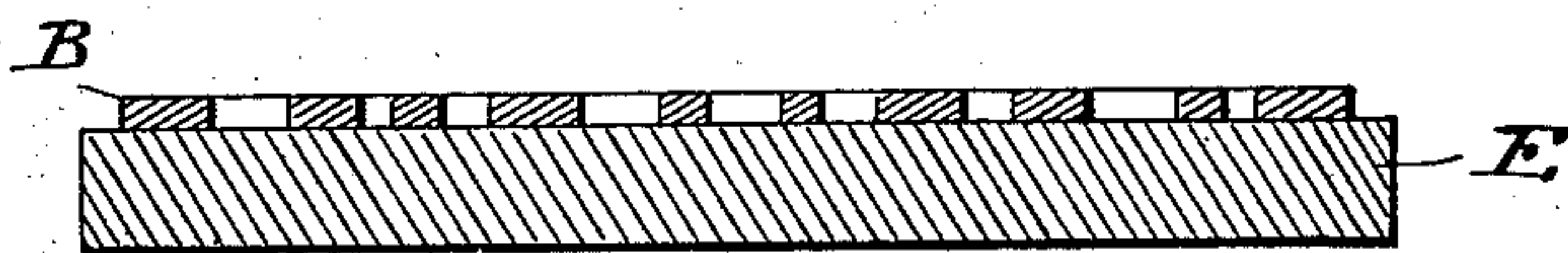


Fig. 4.



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PROCESS OF PREPARING ETCHING-GROUNDS.

SPECIFICATION forming part of Letters Patent No. 654,867, dated July 31, 1900.

Application filed November 15, 1897. Serial No. 658,620. (No specimens.)

To all whom it may concern:

Be it known that I, JOHN BAKER, a subject of the Queen of England, residing at Birmingham, England, have invented certain new and useful Improvements in Processes of Preparing Etching-Grounds, (for which I have obtained Letters Patent in England, No. 6,924, dated April 4, 1895; in France, No. 251,042, dated October 21, 1895, and in Germany, No. 93,392, dated October 22, 1895,) of which the following is a specification.

This invention relates to etching-grounds and processes for the manufacture and subsequent treatment of the same.

The principal feature of this invention is a process for producing a perforated transferable acid-resisting etching-ground with the aid of a form of type or a block or other device having in relief upon it the design which it is desired to reproduce in the etching-ground by the removal of portions of the latter corresponding in shape with that of the upstanding type or design upon the form or block. After the transference to a metal surface of a perforated etching-ground thus produced the metallic surface protected by the etching-ground, except where portions of the latter have been removed, is immersed in the usual acid bath or solution of a metallic salt, and in a few minutes the surface will be found etched to a depth corresponding to the strength of the bath employed and deeply enough for printing from in the ordinary manner. Instead of effecting the removal of portions of the etching-ground by impression they may be removed with the aid of a needle or equivalent hand-tool. As the face of the ground upon which the artist works can in transferring the ground to the plate be placed in contact with the latter, so as to become the back, it is not necessary that the artist should primarily work in reverse by making the right-hand side of his picture that which is to be the left-hand side in a print from the design etching, or vice versa.

According to my invention I obtain a transferable etching-ground by placing or forming an etching-ground of an acid-resisting medium upon a layer of material hereinafter termed a "basis," which ordinarily retains the etching-ground securely, but is readily separable therefrom when desired, either by

being pulled away from it or by being dissolved while the etching-ground remains unaffected. The acid-resisting medium should preferably be such that it can be spread upon the basis in a liquid or viscous state and that it will thereafter dry quickly and completely and become firmly adherent to the basis or to an adhesive facing provided on the latter, or it may be of such a nature that it can be made into a block or mass from which when it is dry thin films can be shaved, each of which will stick firmly to the basis or to the adhesive facing of the basis when pressed thereupon, or it may be prepared as a solution upon which the sheet or layer of the basis is floated to cause a film of the acid-resisting medium to adhere to it. In this last instance the medium must not be too fluid, for it is desirable to coat a face of the basis and not to impregnate it. In any case the resulting ground must be such that the desired portions of it are readily removable from the basis by the touch of an etching-needle or by the contact-surfaces or projecting faces of type or other design pressed upon it, as hereinafter described, and yet it should not spread under the influence of moderate heat or when pressure is applied to the back of its basis in the operation of transferring, nor must it fail when transferred to adhere closely to the metal plate which is to be etched. The acid-resisting medium above referred to can be made by dissolving most kinds of lithographic transfer writing-ink in turpentine, benzin, or other solvent and then spreading the solution upon any of the bases hereinafter described by means of a printer's composition roller, allowing the solvent time to evaporate before the grounds are used for etching. The addition of a little printing-ink—say about five per cent. of the weight of the lithographic ink aforesaid—to the dissolved writing transfer-ink facilitates the distribution of the solution; but it must be used sparingly. An ink suited for use as an acid-resisting medium can be made by mixing together with the aid of heat two and one-half parts of beeswax, one-half part of Pears' soap, one part of Mander Brothers' "medium" varnish, one part of Brunswick black, adding to the mass while in a warm state five parts of spirits of turpentine, these parts being by weight.

For warmer climates than that of England the softer ingredients must be used in lesser quantities. The resulting medium should be spread on the basis to a thickness of, say, 5 one-eightieth or one-hundredth of an inch or less. The basis, if it is to be insoluble, should be capable of being peeled off or otherwise parted from the ground after being moistened on the back and may be, for instance, lithog- 10 raphers' transfer-paper well coated with the coating compositions ordinarily used—such as flour or starch paste, gum, or dextrine, with or without treacle. If the basis is to be soluble, it may be composed, for instance, of 15 a very thin film of gelatin, with or without the addition of dextrine or of saccharine matter. For instance, an addition of dextrine equaling in weight twenty per cent. of the gelatin or an addition of sugar equaling in 20 weight, say, ten per cent. of the gelatin, will be found advantageous. A satisfactory basis can be made by spreading three or four coats of a solution of gum-arabic upon sheets of demy printing-paper, twenty pounds to the 25 ream, and rolling the surface of the sheets to smooth them when the gum-arabic has dried.

Upon one of the hereinbefore-described etching-grounds supported by such a basis the design is produced, removal of portions of the 30 ground being effected by, for instance, impressing upon it a block or other device having a design in relief upon it. For example, the grounds will be very useful to the letter-press printer, as it will enable him to obtain 35 from any type-form a plate which when printed from shall produce white lettering on a dark ground. To prepare an etching-ground for use in etching a plate, a few impressions of the type-form are pulled upon one of the 40 transferable etching-grounds, the type-form being dry-brushed between each impression. Four impressions are sufficient to remove the desired parts of the ground before it has become dry by evaporation of the solvent. If 45 the ground is in a dry state, the type-form must be heated to about blood heat, (98° Fahrenheit,) in which event three impressions will be sufficient to remove the desired parts of the ground. The same method applies to 50 other surfaces having characters or designs thereon. After the design is produced in the etching-ground the ground is transferred by being placed face downward and basis upward on the surface which is to be etched by the 55 acid. A few sheets of damped blotting-paper are laid on the back of the basis and the whole is then placed in a press and pressed. When taken out, the moisture from the damped blotting-paper will be found to have 60 penetrated the basis, which can be readily removed, leaving the manipulated ground firmly adhering to the surface on the plate desired to be etched. The plate is then immersed in an acid-bath and etched to a depth corresponding to the strength of acid and deeply enough 65 for printing from in the ordinary manner. Any further depth desired can be obtained

by subsequent treatment as for ordinary zinc etching.

In the accompanying drawings in section, 70 Figure 1 represents a suitable ground upon a prepared basis and in readiness for an impression from the type-block. Fig. 2 represents the ground after perforation, still adhering to the basis. Fig. 3 represents the per- 75 forated etching-ground transferred from the basis to the plate to be etched, and Fig. 4 shows the etched plate.

A indicates the type-block.

D is a sheet of paper coated with gum-arabic, 80 C the paper and gum-arabic, together forming the basis upon which the ground B is placed, and E indicates the plate to be etched.

Ordinarily the acid acting through the openings of the etching-ground produces a 85 sunken design by eating into the surface exposed below the openings; but if the design is required to be in relief the transferred ground having the design upon it and lying on the plate is washed over with an acid-resisting 90 varnish insoluble in any solvent by which the transferred ground can be dissolved. Shellac varnish, for example, would serve the required purpose. The varnish should be allowed to dry, after which the plate must be 95 slightly warmed and washed over with turpentine, which removes the ground, and in doing so the dried varnish, except where the latter is in direct contact with the plate, and where, consequently, there is no intervening 100 ground—that is to say, except where the lines or characters of the design occur. Therefore the latter are formed upon the plate in protective varnish, and all other parts of the plate save these will be bitten or etched when 105 the etching-acid is poured onto it, so that the design will be left in relief.

The transferable grounds can be made of many acid-resisting materials, alone or in combination and other than those hereinbefore 110 specifically referred to by way of example, and the basis of these grounds can be made of various substances, preferably those of a gelatinous or glutinous nature for the wholly-soluble bases and of a gummy, saccharine, 115 glutinous, farinaceous, or other material of a viscous or pasty nature or capable of being readily made so for the other bases, or cellulose or fibrous or other bibulous substances can be impregnated or coated or otherwise 120 charged on the surface with any such substance or with a soluble substance to form a basis for the acid-resisting transferable grounds.

A further advantage of my invention is that 125 a design to be etched can be drawn on a piece of ordinary transfer-paper and have one of my transferable etching-grounds superposed upon it. The latter being transparent, the design on the ordinary transfer-paper shows 130 through it and serves as a guide to the artist in using the etching-needle or the like on the ground.

The various processes hereinbefore de-

scribed may be varied and other details of the improvements hereinbefore exemplified altered or modified without departing from the nature of my invention.

5 It is to be understood that where a "relief" design is herein referred to the expression is meant to include also such designs as would result from the removal of portions of a level surface in the production of an intaglio
10 thereon.

I claim—

The process of preparing etching-grounds which consists in coating a suitable base with

a film of acid-resisting material, perforating said material in accordance with the design 15 to be etched and removing the film from the base after perforation for transfer to a plate to be etched, substantially as described.

In witness whereof I have hereto set my hand in the presence of the two subscribing 20 witnesses.

JOHN BAKER.

Witnesses:

FRANK H. SOUTHAM,
ERNEST HARPER.