(No Model.)

F. J. KALLENBACH.

LITHOGRAPHIC STONE.

No. 579,680. Patented Mar. 30, 1897.

FIG:1.

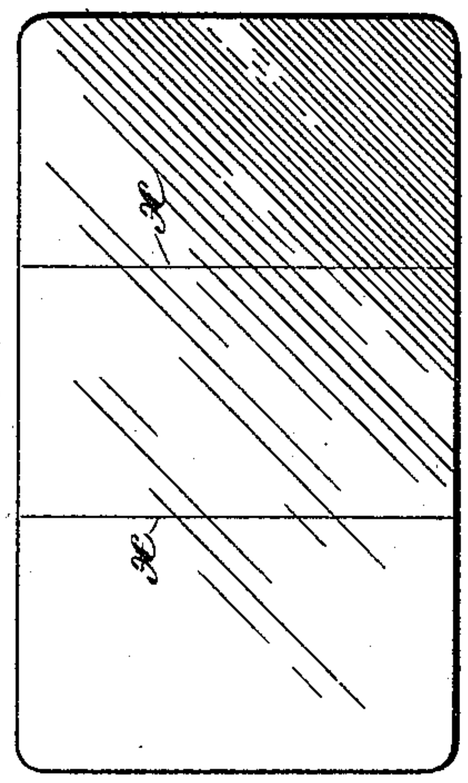


FIG:2.

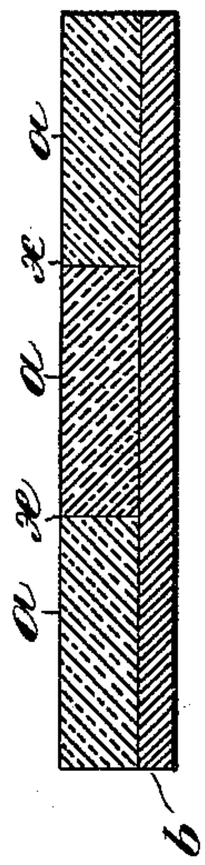


FIG:5.

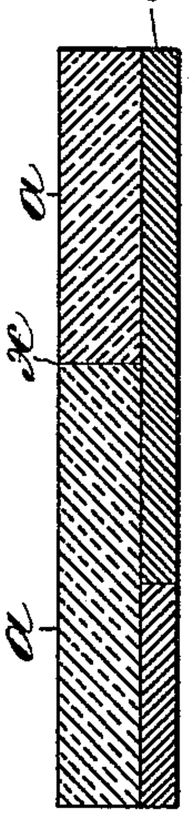


FIG:3.

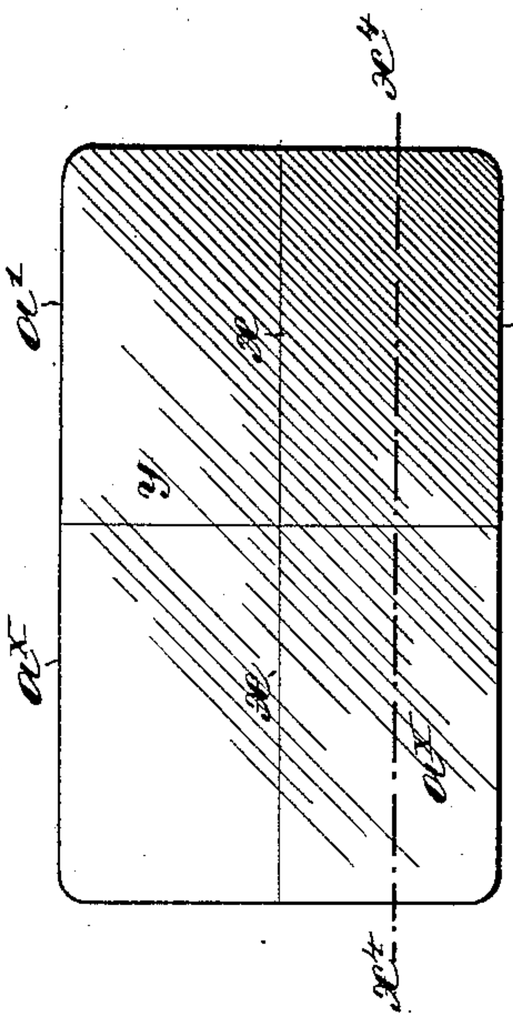
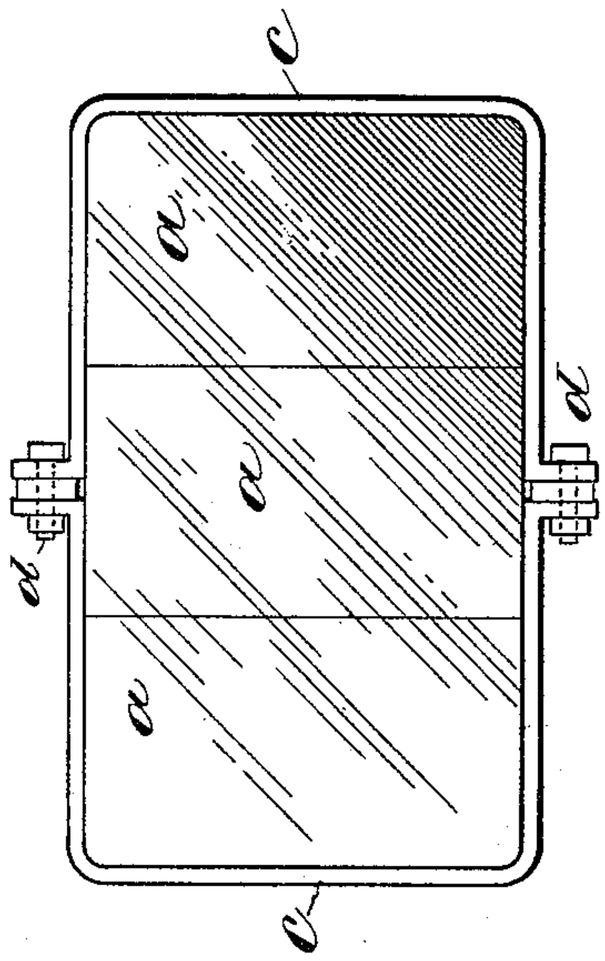


FIG:4.

FIG:6.



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LITHOGRAPHIC STONE.

SPECIFICATION forming part of Letters Patent No. 579,680, dated March 30, 1897.

Application filed February 11, 1897. Serial No. 622,979. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND J. KALLENBACH, a citizen of the United States, residing at Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Lithographic Stones, of which the following is a specification.

My invention relates to stones used for lithographic printing.

It is well known to those familiar with the art of lithographic printing that the cost of a lithographic stone increases in an exaggerated proportion to its size, the larger stones costing much more per square inch than the smaller. At the same time the smaller stones are often quite perfect, but their usefulness is restricted because of their size.

The purpose of my invention is to produce a composite lithographic stone with which printing may be done of the same character as if the stone was actually in one piece.

In carrying out my invention I take the lithographic stones and after preparing their edges so that they are perfectly true, smooth, and square I place them together edge to edge, making a joint so perfect and accurate that it will not show in printing. The stones being so arranged, I proceed to secure them immovably in this position, so that they will not shift with relation to each other and so that the joint will not open. While this may be accomplished in various ways, I have found that the most practical and satisfactory way is to unite the edges of the several stones forming the composite stone by cement and then to mount the stones so united on a backing or slab of slate, to which they are cemented. The slate base or backing ties the several lithographic stones together so as to form a large composite stone, and as the slate has substantially the same coefficient of expansion as the lithographic stone there is no liability for the joint to open when the composite stone is subjected to changes of temperature. The slate backing also adds strength to the structure, the whole forming an exceedingly strong and practically integral stone.

In the accompanying drawings, illustrating the invention, Figure 1 is a face view of an oblong lithographic stone constructed according to my invention from three smaller stones, and Fig. 2 is a longitudinal section of the same. Fig. 3 is a view similar to Fig. 1, showing a stone built up of four smaller lithographic stones; and Fig. 4 is a longitudinal section of the same at line x^4 in Fig. 4. Fig. 5 is a sectional view of a composite stone having a backing composed of two pieces. Fig. 6 illustrates mechanical means for binding the stones together so that they will not shift at the joints.

Referring particularly to Figs. 1 and 2, *a* represents the several sections of lithographic stone fitted together edgewise along the lines *x*, and *b*, Fig. 2, is the slate base upon which the sections *a* are mounted.

The stones *a* are dressed on both faces and their meeting edges so carefully dressed that when fitted together the joints *x* will not "print"—that is, will not be visible—in prints made from the composite stone. The stones or sections are then preferably placed on a carefully-dressed slab or base *b* and cemented firmly thereto. They may also be cemented to each other, though this may not be necessary in all cases. Preferably, also, the printing-face of the composite stone will be carefully finished after the sections are mounted on the backing slab or base.

It will be obvious that any number—two or more—of the smaller lithographic stones may be thus combined to form a larger composite stone.

When the above-described mode of mounting the stones is employed, the backing used should having substantially the same characteristics as to expansion and contraction as lithographic stones and have a sufficient strength, and I find slate to be a satisfactory material for the purpose.

I prefer to cement the stones together at the joint or joints, and when this mode of uniting them is employed I prefer to employ the kind of cement used by lithographers for backing worn stones with slate. This cement will resist the action of the acid used by lithographers for etching stones to about the same extent as the stone itself. Such cement is primarily in a liquid condition, and when it is to be used at the joints between the stones I prefer to strain it so as to remove all coarse particles therefrom, as this insures the edges of the stones being brought snugly together at all points. Where the cement is more readily acted on by the acid

than the stone, it is apt, in the course of time, to be eaten away and allow the acid to penetrate the joint and injure it.

Figs. 3 and 4 illustrate the preferred construction where cross-joints are required in making the composite stone. I find it somewhat difficult to dress up the two adjacent edges of a lithographic stone so as to preserve a perfect corner at the junction of the four stones, and to obviate this difficulty I mount the stones $a^{\times}$ $a^{\times}$ on a backing $b^{\times}$, Fig. 4, and the stones a' a' on a backing b'. These two built-up sections, backing and all, are then carefully dressed at their meeting edges to form the cross-joint y and are then mounted on another auxiliary backing b^{2}, as clearly shown.

It is not absolutely essential that the backing shall be in one piece, although it will be ordinarily and by preference of this character. Fig. 5 shows a composite stone in which the two lithographic stones are of different sizes and the backing is made up of two pieces, the larger being arranged to overlap the joint x between the lithographic stones.

Fig. 6 shows a means of clamping and binding the several stones together with bands c and bolts d.

I am aware that segments of lithographic stone with convex surfaces have been mounted on a drum for printing on a web, and I am also aware that it has been proposed to embed thin slabs of lithographic stone in plastic artificial stone; also, that a thin worn lithographic stone has been mounted on a cheaper quality of stone or slate to impart strength. My invention, however, in no respect resembles the product produced by either of these operations. I join two or more pieces of lithographic stone in order to form a surface for lithographic printing which is like that afforded by a single larger lithographic stone. So far as I am aware this has never been done before.

I have defined both in this specification and in the claims appended thereto the kind of joint I produce as a joint that will not show up in printing. I mean by this expression that I so unite a plurality of stones that a composite stone is produced which may have placed upon it a design, either by transfer or in any other of the ways known to lithography, with the lines crossing the joint, and when a print is taken the lines of the design will be substantially unbroken—that is to say, the print will have the same characteristics it would have if it were taken from an integral stone.

While I have discovered that lithographic stones can be so united that the line of joining will not show in printing the most delicate kinds of work, such, for instance, as fine-line tints and delicate stipple-work, yet it is not always necessary to make so close a joint for printing all kinds of work, such, for instance, as the coarser kinds of color-work or work in which a number of colors are to be superposed. The phrase hereinafter used in the claims to define the joint between the stones—viz., such a joint that it will not show up in printing—is therefore to be understood in a relative sense, as the joints made may vary in accordance with the kind of printing to be performed by my composite stone.

Such a stone as is made by means of my invention has also the advantage that the joints or points where the smaller stones are joined will not be disclosed in use to the same extent that the veins which are ordinarily found in the natural stones of a larger size are disclosed in the use and manipulation of such larger stones.

Having thus described my invention, I claim—

1. A composite lithographic stone, consisting of two or more lithographic stones so fitted together at their meeting edges that the joint will not show up in printing and suitable means for holding the said stones with their edges in such contact, whereby an increased and a substantially continuous printing-surface is secured.

2. A composite lithographic stone, consisting of two or more lithographic stones so fitted together at their meeting edges that the joint will not show up in printing, and a slate backing on which said stones are secured, said backing serving to hold the stones with their edges in such contact, whereby an increased and a substantially continuous printing-surface is secured.

3. A composite lithographic stone, consisting of two or more lithographic stones so fitted and cemented together at their meeting edges that the joint will not show up in printing, and suitable means for holding the said stones with their edges in such contact, whereby an increased and a substantially continuous printing-surface is secured.

4. A composite lithographic stone consisting of a plurality of minor composite lithographic stones, each with a backing-slab, the said minor composite stones being so fitted and cemented together at their meeting edges that the joints will not show up in printing, and an auxiliary backing on which said minor composite stones are mounted and cemented.

5. A composite lithographic stone, consisting of two or more lithographic stones so fitted together at their meeting edges that the joint will not show up in printing, and a backing on which said stones are secured, the stones being cemented together at said meeting edges by a cement which will resist the etching acid to substantially the same extent as the lithographic stone.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FERDINAND J. KALLENBACH.

Witnesses:
HENRY CONNETT,
PETER A. ROSS.