

(No Model.)

H. F. BELCHER.

MOSAIC OF GLASS AND LEAD GLAZING.

No. 317,077.

Patented May 5, 1885.

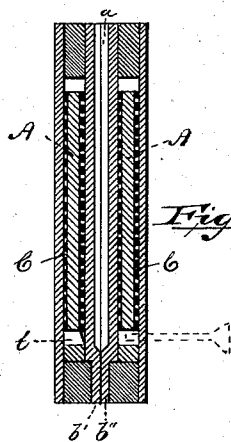


Fig. 2

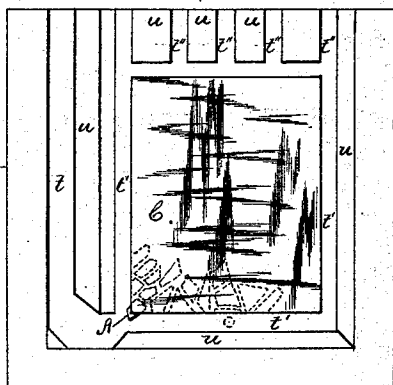


Fig. 1

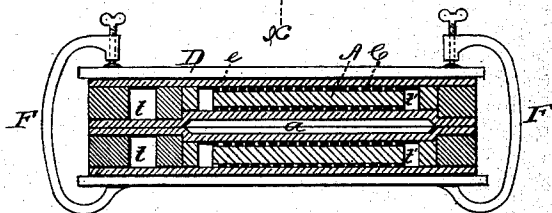


Fig. 3

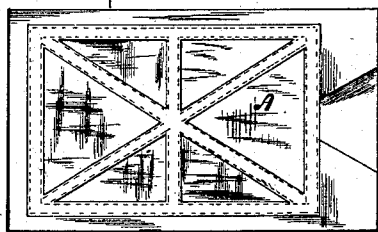


Fig. 4

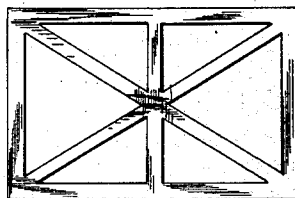


Fig. 5



Fig. 6



Fig. 7

Attest:

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UNITED STATES PATENT OFFICE.

HENRY F. BELCHER, OF IRVINGTON, NEW JERSEY.

MOSAIC OF GLASS AND LEAD GLAZING.

SPECIFICATION forming part of Letters Patent No. 317,077, dated May 5, 1885.

Application filed September 1, 1884. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. BELCHER, a citizen of the United States, residing at Irvington, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Mosaics of Glass and Lead Glazing; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in mineral mosaics and the process of manufacturing the same, set forth in a patent granted to me August 12, 1884, No. 303,359, the object being to secure to the mosaic an improved appearance, increased strength and durability, and to more uniformly perfect frame-work.

The invention consists in the improved mosaic and the process of manufacturing the same, substantially as will be hereinafter set forth, and finally be embodied in the clauses of the claims.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the figures, Figure 1 is a plan of a portion of a mold employed in the improved process. Fig. 2 is a section of the mold taken through line *x*; and Fig. 3 is a section taken through line *y*, Fig. 1. Fig. 4 is a plan of a mold, showing certain arrangements hereinafter set forth. Fig. 5 is a plan of a skeleton frame employed in forming the complete mosaic; and Fig. 6 is a section taken through line *z*, Fig. 4. Fig. 7 is a sectional view of a completed mosaic with projecting jewels.

In carrying out the invention, I arrange the glass or mineral plates *A* of the mosaic on a suitable table or support in separated relations to each other, so that channels or passages will be formed around and between them. Over said channels or passages and connecting said plates is laid a strip or strips of thin sheet metal, preferably of brass, the edges of which may slightly overlap said plates, as in Figs. 4 and 6. Over said plates and metallic channel-coverings is pressed a gummed or

adhesive sheet of asbestos or other suitable material, which binds said parts together. In this condition the sheet of asbestos, with the mineral and metallic parts adhering thereto, is turned over, the said parts remaining, however, in the same relation to each other, so that the channels or passages are again brought to view. These are again in like manner covered with metallic pieces or strips, or with a single piece formed as illustrated in Fig. 5, and then with an adhesive sheet of asbestos. The metallic covering may be omitted from one side, should I desire to have on one side of the mosaic the cast-metal core of the framework exposed to view. The parts thus described are then placed in a suitable mold or placed in a clamp, turned edgewise, and the passages filled with molten metal, which, hardening, forms a core between the edges of the glass, and, uniting with the sheet-metal coverings, holds the same in position. Said sheet metal in overlapping the plates holds the same more firmly in position.

To cause the molten metal to remain in a perfect state of liquefaction and to flow freely in and through the passages between the parts thus described, even though the said passages be extremely narrow, when it is desired to produce fine "lead-lines," and to hold the asbestos more evenly and perfectly against the sides of the said parts, and furthermore, to facilitate the process of casting, I prepare the mold substantially as follows: Said mold is composed of duplicate parts, Figs. 2 and 3, with a chamber between, into which molten metal, which may be termed "back metal," is poured before the metal intended for the frame of the mosaic is run into the channels between the glass plates. This back metal raises the temperature of the different parts of the mold and the inclosed glass to a uniformly high degree of temperature, whereby the glass is prevented from breaking when the frame metal is subsequently poured, and also prevents said frame metal from prematurely cooling. Said back metal, as will be obvious, enters all the inequalities of the asbestos backing to the glass, caused by the unequal thicknesses of the pieces of said glass and the metallic coverings lying against the sides of said glass, and pressing against the said metal and glass pieces prevents the frame metal from separating the as-

bestus from the sides of the said sheet metal and glass pieces, and allowing the said frame metal to flow between to the injury of the said mosaic.

- 5 The molds, as above intimated, are in duplicate, *a* being the back-metal chamber surrounded, except at the mouth, by a lining of asbestos felt or other non-combustible material, *b' b''*, of any suitable thickness. Each of
10 the duplicate parts of said mold is provided with a feeding-channel, *t*, branch passages *t'*, through which the molten metal flows to the channels or passages between the glass, and vents or outlets *t''* for the escape of air, gas, or
15 superfluous metal. Said channels, passages, and outlets are formed by suitable sheets or strips of asbestos felt *u*.

C indicates the gummed or adhesive sheets before referred to. D are the clamping-surfaces having a suitable non-combustible lining, *e*, and F are clamps binding the whole together.

- In preparing the surface or finishing metal of the frame-work, I prefer to coat the thin
25 sheet metal from which it is obtained with varnish, and then mark or trace upon the varnished surface with a suitable steel point or tool the desired pattern of the frame-work. I thus expose the metal to the action of acids,
30 which, when applied, cut through the metal at said lines or tracing-marks and sever the frame from the body of the sheet.

- The core portion of the frame-work may be covered with a superficial metallic finishing
35 covering in any other way—for example, by nickle-plating. When a sheet-metal covering is employed, the same may be prepared to cover the channels in any suitable manner. For example, when I wish to employ said covering with projecting jewels, as in Fig. 7, I
40 may stamp out with a die or tool holes or perforations of a size to receive the projecting portions of the jewel, but catch the shoulder thereof. A second corresponding sheet may
45 be placed on the under side to cover the under edges of said jewel and the whole united by molten metal, as in the manner before described, or in any other manner.

- To give coherency and increased stiffness
50 to the mosaic, so that it is better able to resist the influence of the wind or other lateral pressure, I may insert or cast flat steel wire, similar to that known as "hoop-skirt wire," transversely in the frame, as shown at *p*, Fig.
55 7. This, while being generically similar to the core-wire in my former patent above mentioned, is specifically an improvement thereon, in that it adds increased lateral stiffness to the mosaic.

- 60 Having thus described the invention, what I claim as new is—

1. In a mosaic for windows and other purposes, the combination, with the mineral plates A, of a cast-metal frame-work having a superficial metallic finishing-covering, substantially
65 as set forth.

2. As an improved article of manufacture,

the mosaic consisting of glass or mineral plates having a cast-metal frame-work provided with a sheet-metal facing, substantially as set forth.

3. A mosaic consisting, essentially, of glass or mineral plates having a metal frame-work to hold said plates together, said frame being of cast metal between the edges of said plates and of sheet metal at the exposed surfaces, said sheet metal overlapping the plates to more securely hold the same in position.

4. In a mosaic, the flat-wire core cast transversely in the frame-work, substantially as shown and described.

5. The process of manufacturing mosaics of glass or other mineral plates, to wit: of arranging saw-plates in a separated relation to one another between clamping-surfaces provided with a back metal receptacle or chamber separate from the glass, of filling said receptacle with molten metal to raise the temperature of the glass and mold and secure a uniform resistance to the frame-metal, and filling the
5 channels between said plates with molten metal, substantially as and for the purposes set forth.

6. The process of forming mosaics of glass or other mineral plates, to wit: arranging the
9 glass between sheets of asbestos or other suitable sheets, arranging duplicate sets of said sheets, with the glass between apart, in a mold to form a chamber between said sets, filling said chamber with molten metal, and subsequently casting a frame-work to unite the said
10 glass plates, as set forth.

7. The process of forming mosaics, to wit: of arranging mineral plates in a separated relation to one another to form channels or passages between, covering said channels with
10 sheet metal, fixing the relations of said parts with an adhesive sheet, arranging the whole in a suitable mold, and casting a metallic frame-work in said passages to unite said
11 mineral plates and sheet-metal covering, substantially as set forth.

8. The process of manufacturing metallic frame-work around mineral plates or portions in a mosaic, to wit: arranging said plates or
11 portions in a separated relation to each other to form passages between, covering said passages with sheet metal, and casting molten metal in said passages to bind the parts together, substantially as set forth.
12

9. In the process of manufacturing mosaics of glass or other mineral plates, the process of raising the temperature of said plates and holding the asbestos clamping-sheets in close engagement with the sides thereof by casting
12 a molten back metal at the sides of said clamping-sheets opposite said glass portions prior to casting the frame metal, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 14th day of
August, 1884.

Witnesses: HENRY F. BELCHER.
F. F. CAMPBELL,
OLIVER DRAKE.