

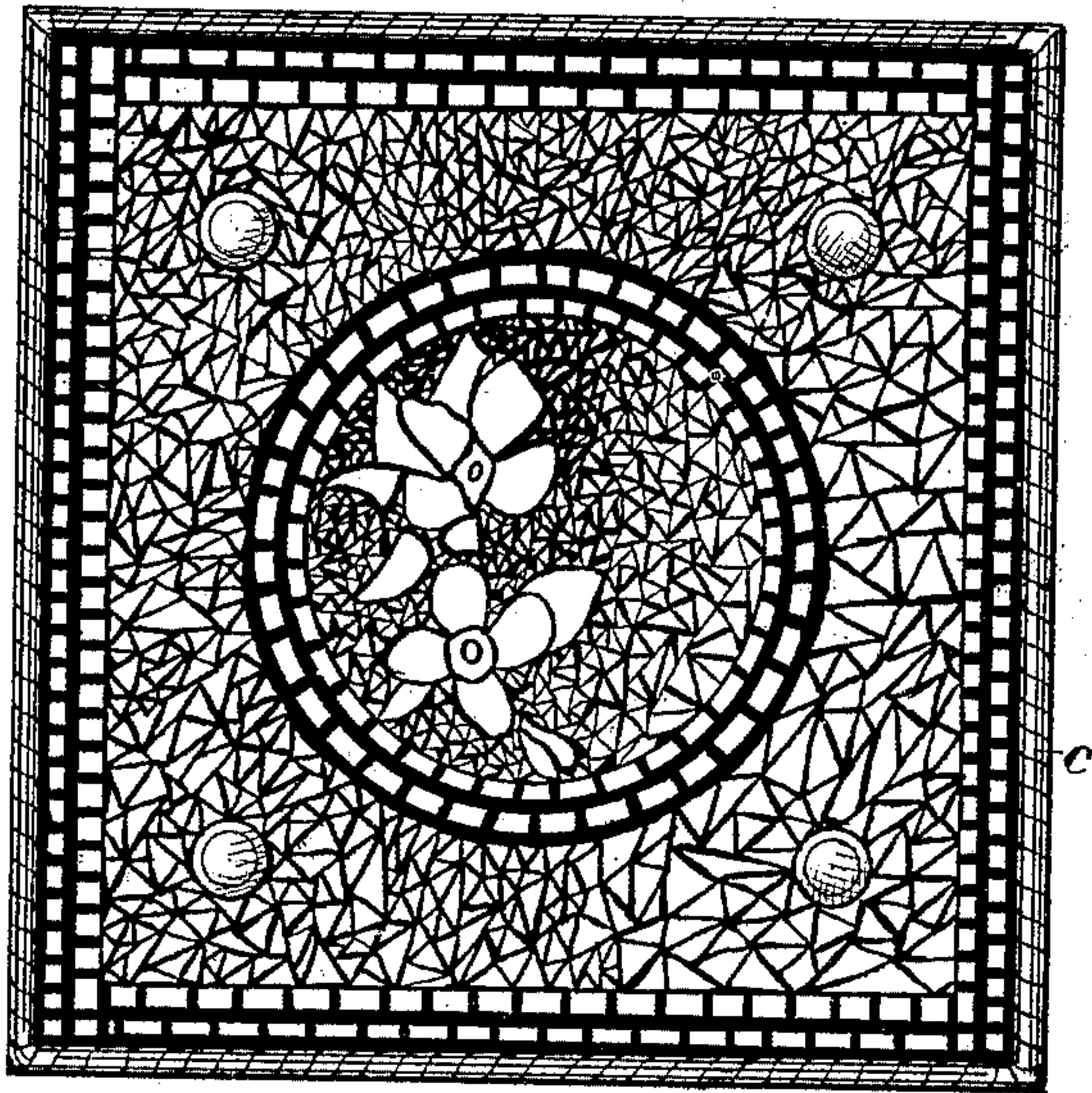
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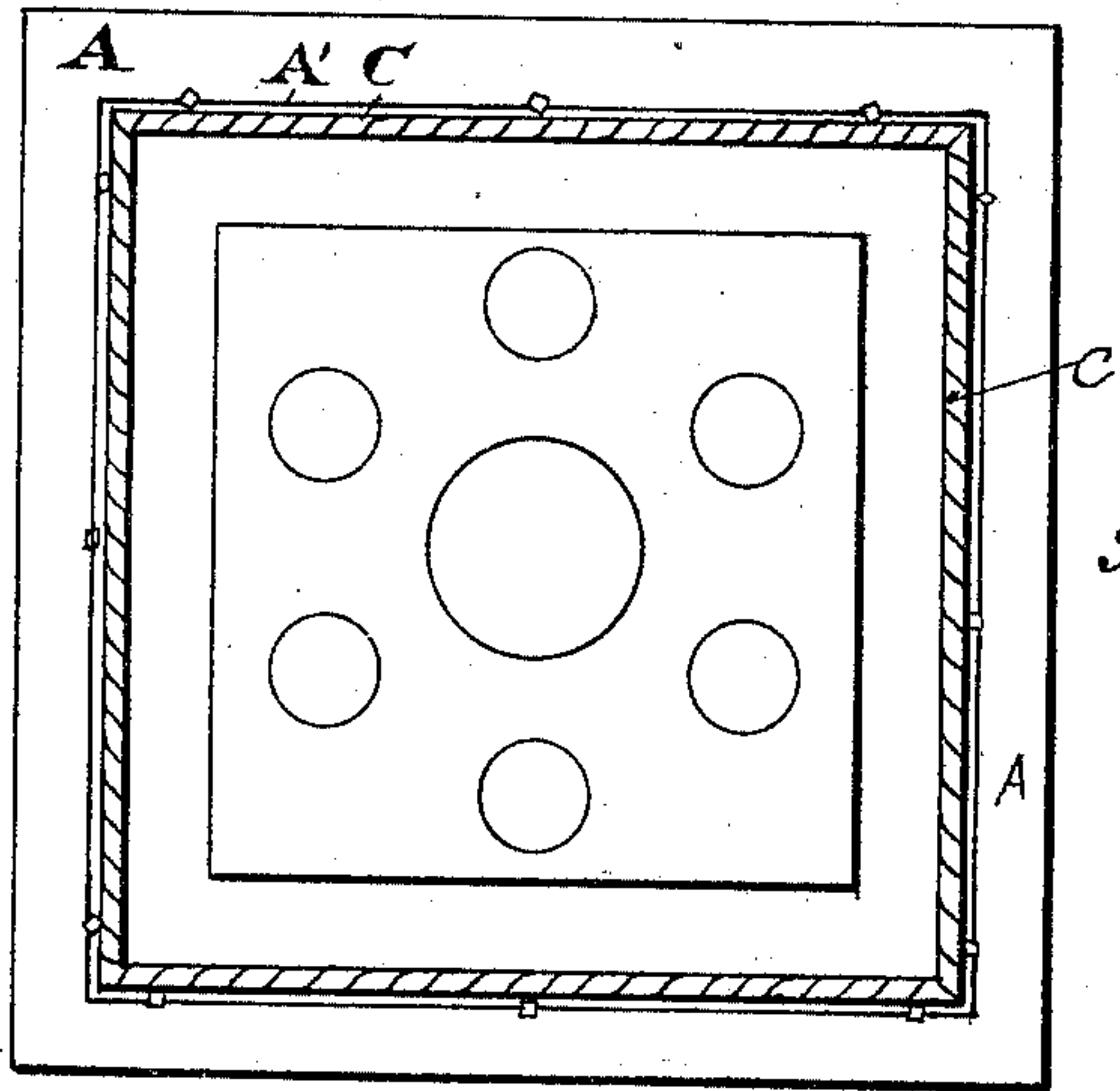
H. F. BELCHER.  
MOLD FOR MAKING MOSAICS.

No. 396,912.

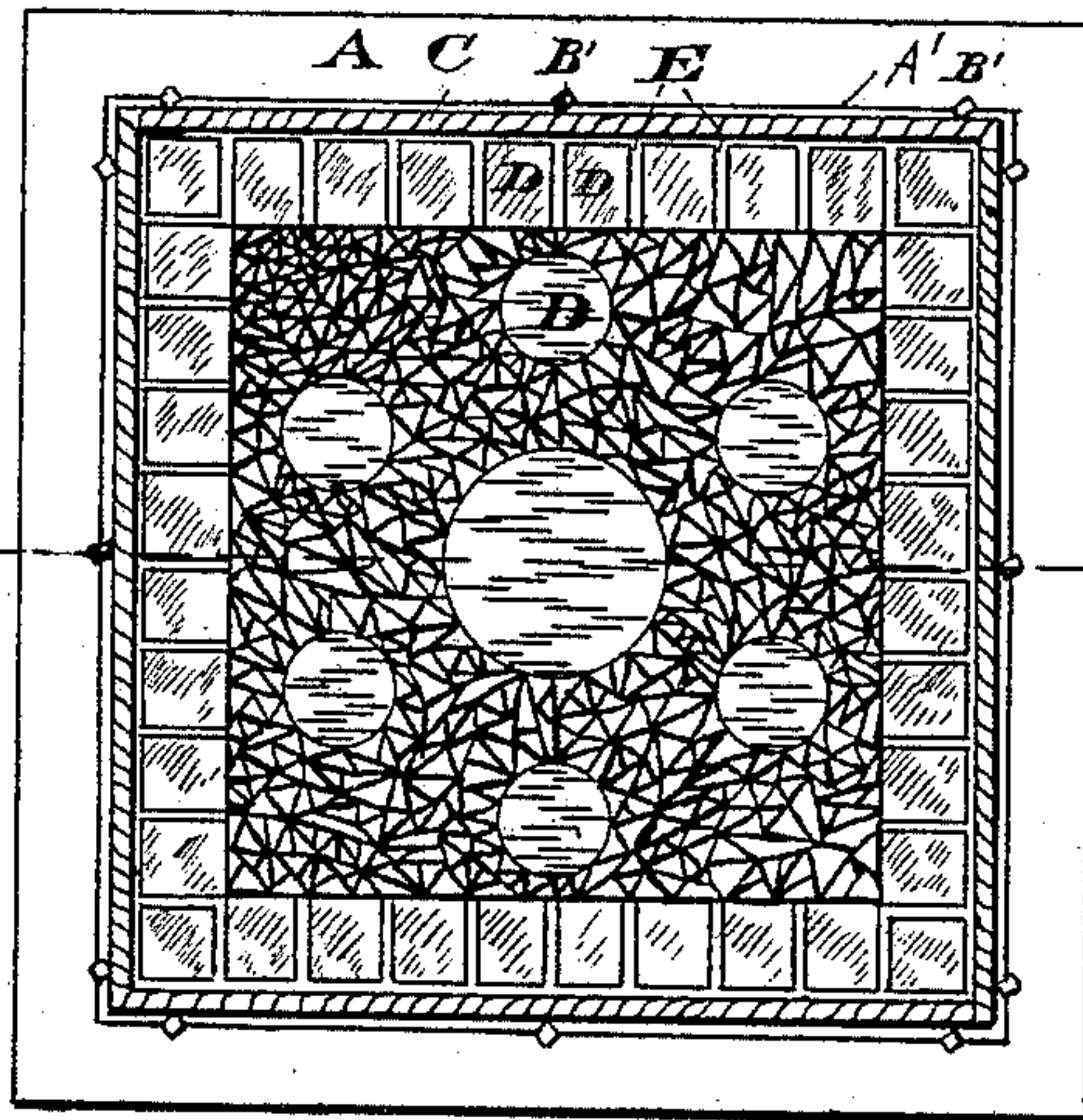
Patented Jan. 29, 1889.



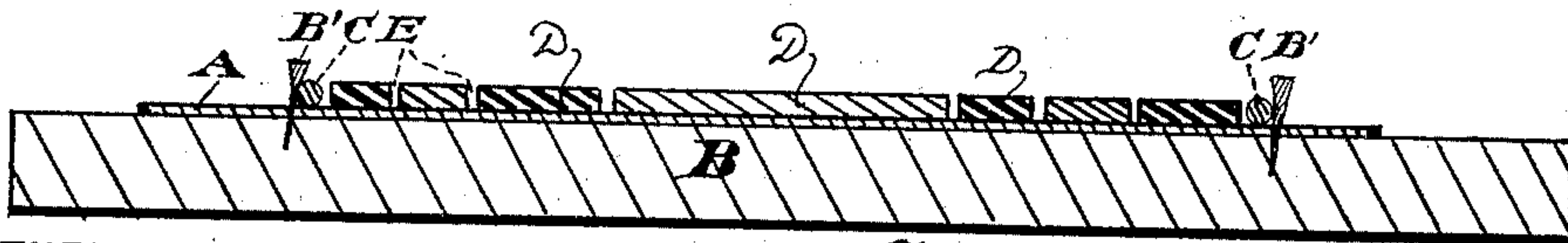
*Fig. 1.*



*Fig. 2.*



*Fig. 4.*



*Fig. 3.*

WITNESSES:

INVENTOR

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H. E. Rowe

*Henry Foster Belcher,*

BY *Drake & Co.* ATTY'S.

(No Model.)

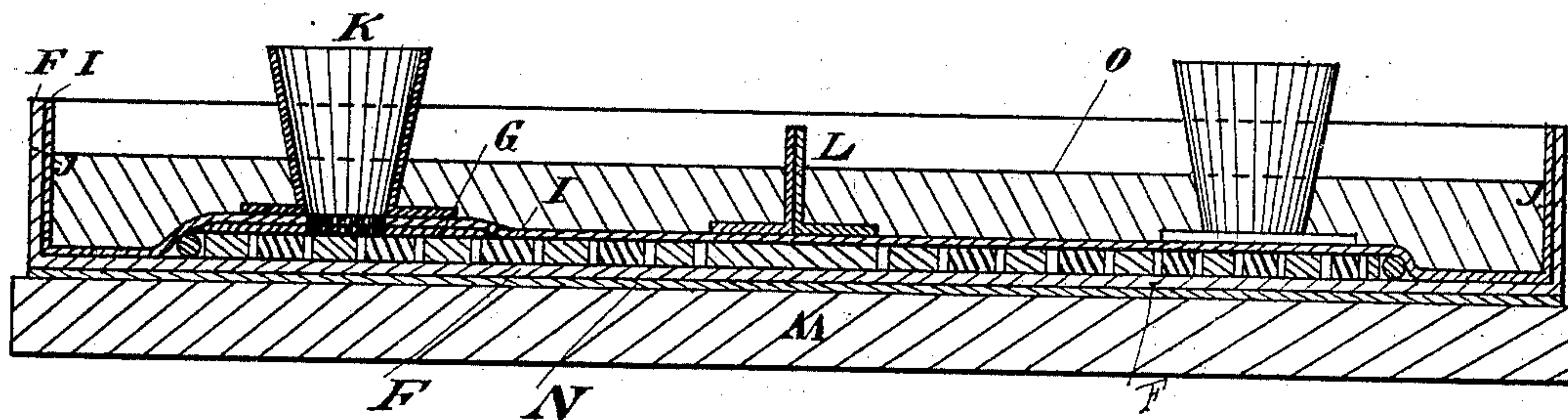
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H. F. BELCHER.

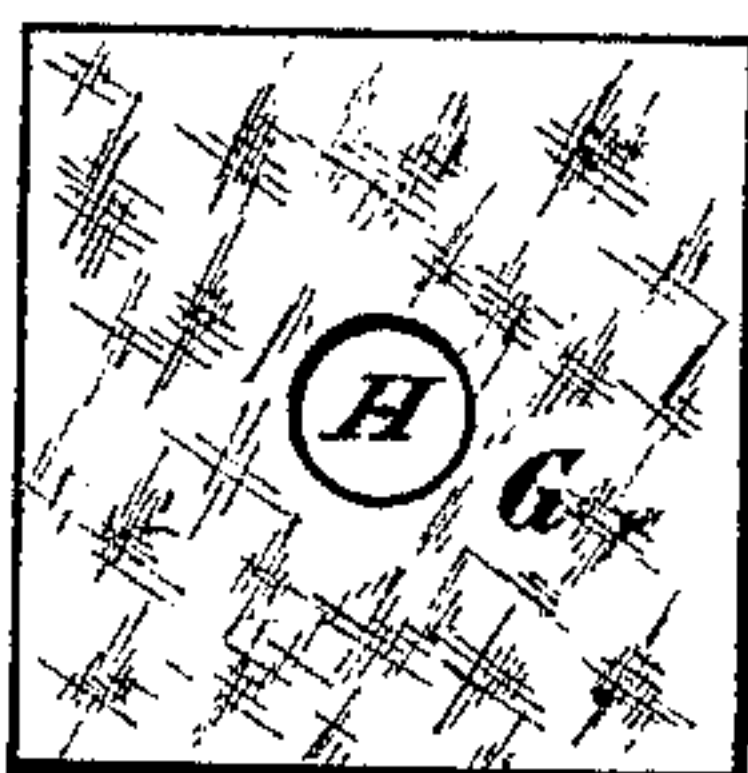
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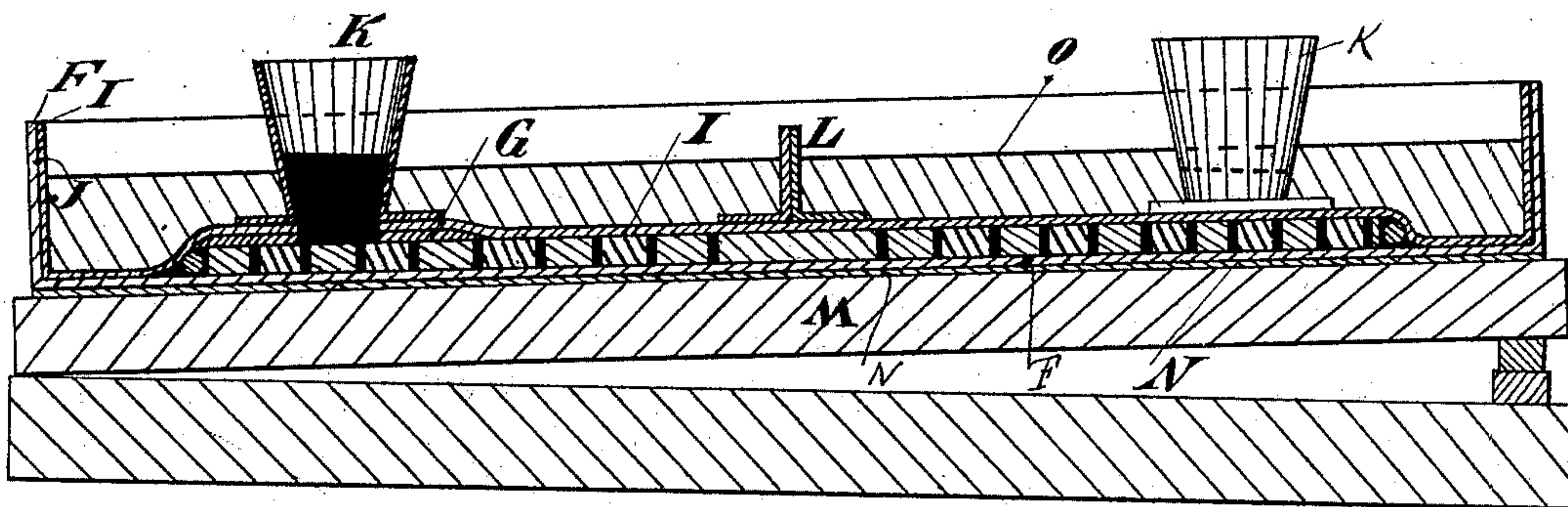
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*Fig. 5.*



*Fig. 6.*



*Fig. 7.*

Witnesses  
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E. L. Sherman

Inventor:

*Henry Foster Belcher,*

By his Attorneys

*Drake & Co.*



# UNITED STATES PATENT OFFICE.

HENRY F. BELCHER, OF IRVINGTON, NEW JERSEY.

## MOLD FOR MAKING MOSAICS.

SPECIFICATION forming part of Letters Patent No. 396,912, dated January 29, 1889.

Application filed May 11, 1887. Serial No. 237,791. (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 Molds for Making Mosaics; 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 molds for making that class of mosaics of glass or other mineral pieces or plates described and illustrated in certain prior patents granted to me, the first of which was issued to me from the United States Patent Office August 13, 1884, and numbered 303,359, and the second May 5, 1885, and numbered 317,077, the object of the invention being, first, to simplify the process or method of manufacture and to reduce the cost thereof by avoiding the use of complicated clamps, molds, and other appliances, sets of which were required for the various-sized lights, and by avoiding the use of costly alloy—such as is employed in casting the frame-work of the lights, as “back metal”—for pressing the asbestos of the molds against the sides of the plates or pieces of the mosaics, whereby the waste of said costly alloys—such as is occasioned by oxidation or dripping—is materially reduced.

A further object is to secure a more durable article of manufacture better adapted for use in windows, globes for lamps, and other articles.

The invention consists in the improved mold substantially as will be hereinafter set forth, and finally be embodied in the clauses of the claim.

Referring to the accompanying drawings, in which like letters indicate corresponding parts in each of the several figures, Figure 1, Sheet 1, is a plan illustrating a mosaic manufactured in accordance with the improved process. Figs. 2 and 4 are plans illustrating certain steps in the operation of forming the mold. Fig. 3 is a sectional view taken through

line *a*, Fig. 4. Fig. 5, Sheet 2, is a sectional view of a mold ready to receive the top metal; and Fig. 6 is a plan of a certain guiding or indicating piece employed in the same mold. Fig. 7 is a sectional view of the mold after the top or back metal has been cast and set, the mold tilted, and the frame-work metal poured to hold the glass pieces in position.

In carrying out the invention in accordance with the process I first secure a detailed working drawing from the artist, which is usually made upon heavy drawing-paper. From these drawings I take upon thin Manila or other tracing-paper, as *A*, a series of tracings having the general outlines of the design. These tracings are equal in number to the number of lights or mosaics desired. The transferred drawing or tracing is now arranged upon a flat table or surface, *B*, and is held in position thereon by a series of tacks, *B'*, placed on the outer lines, *A'*, of the said drawing or tracing, or the lines corresponding with the outer edge of the desired light, the tacks of said series extending entirely around the sides of the design and slightly projecting inward from the inner edges of said lines. Against the tacks on the inner sides thereof and all around said design is placed a wire, *C*, preferably about one-eighth of an inch thick and of twisted annealed steel. This wire finally becomes incorporated in the frame-work of the mosaic, forming an outer binding for the light, the cast metal of the frame-work passing into the recesses formed by the twisting, so that a perfect and durable union is formed. The outer edge of the light thus commenced, because of the projecting tacks above referred to, is given a size slightly smaller than the design, so that the said light easily slips into its receptacle in the sash without any preliminary trimming. The wire, where the design is complex or provided with curved sides, is preferably bent to assume the desired outlines before being arranged in contact with the tacks which hold said wire in the exact position desired. In the completed light the binding-wire serves as a suitable edging, providing a suitable bearing for the heads of the tacks or nails in holding the mosaic firmly and securely in position in the frame or sash. Within the edging thus formed are arranged



small pieces of glass, D, previously cut to the desired shape and size. They are placed in the position called for in the drawing. In setting the said pieces great care must be  
 5 used to place the pieces at regular distances apart, so that spaces or channels E are formed between the pieces of sufficient capacity to allow the flow of metal therethrough. The pieces are cemented fast to said paper either  
 10 by applying the cement to each individual piece, and in that condition laying the said piece upon the design or by applying the cement first to the tracing and laying the glass pieces thereon. The thinness of the tissue-  
 15 paper prevents the design from being distorted or destroyed when the paper is dampened by the cement and subsequently dried by expansion and contraction, such as would occur if the paper were of greater thickness,  
 20 such as is generally employed in making the original drawing or design. The mosaic, after the pieces of glass have been arranged in accordance with the drawing, is now covered with a suitable sheet, F, of asbestos or other  
 25 material not affected by molten metal made adhesive with glue or cement. This is of sufficient size to extend about three inches beyond each edge of the tracing and forms a margin not covered with glass pieces. Said  
 30 sheet is pressed in place, so as to adhere closely to the upper faces of the glass. While the sheet of asbestos is still wet with gum it is covered with a second sheet of abestus, either entirely or only at such places as have  
 35 been broken or torn when pressing the first said sheet down upon the glass, so that all openings through which the metal might escape from the mold are perfectly closed. The work is now set aside to dry, which must  
 40 be thoroughly done. When dry, the work is turned over on the table, so as to bring the piece of glass and the tracing-paper uppermost, and the latter is removed by dampening and rubbing it or by other means, thus  
 45 leaving the upper side of the glass pieces of the mosaic bare. If any spaces were left in the mosaic for jewels, the same are then filled. At points where I desire subsequently to arrange feeds or vents—preferably where the  
 50 passages between the glass plates diverge in various directions from a given center—I cement a small sheet of asbestos, G, of a size of about one inch and a half square, with a hole, H, about one-quarter of an inch in diameter,  
 55 at the center, as shown in Fig. 6, so that said hole coincides with said divergent center, said perforated sheet serving as a guide for the eye in placing the vents or feeds, enabling me to place said vents or feeds in appropriate  
 60 positions. A second coating, I, of asbestos is now applied to the glass pieces, care being taken to rub down the edges of the coating around the outer sides of the wire and to press the sheet into each irregularity caused by the  
 65 uneven glasses and the varying thickness thereof, but leaving the passages between the pieces of glass free to allow the flow of the metal

therethrough. While the outside edges of the asbestos are still wet, they are turned up, so as to form side or vertical flanges, J, about  
 70 one inch around the design, the overlapping corner portions being cemented to hold said sides in position. The mold thus formed is now laid away to be thoroughly dried. The  
 75 upper sheet is then perforated at the points indicated by the underlying perforated pieces G, and at the perforation thus formed funnel-shaped vents or feeds K are secured in place. These are preferably of asbestos, and are preferably cemented in place, so that the metal  
 80 poured therein flows through them into the passages between the glass pieces.

The shallow dish-shaped receptacle or mold may be divided by partitions L, extending  
 85 across from side to side, which serve to separate the back metal subsequently poured therein, so that the said metal, hereinafter referred to, will be divided into slabs of about twelve inches in width, which may be easily  
 90 handled when cold.

Having formed the mold ready for the casting process, I arrange it upon a strong horizontal table, M, or platform, of sufficient  
 95 width and about eighteen inches in height, which is so arranged on bearings as that it may be readily raised or lowered at will at either of its corners or sides from one-eighth to one-half an inch. Upon this table I may place a piece of asbestos board or paper, N,  
 100 of about one-fourth of an inch in thickness and about as large as the mold or mosaic to be cast. This is, when used, arranged beneath the mold, between it and the table, and serves to retain all possible heat while the mosaic is being cast. The mold being thoroughly dry,  
 105 I pour molten metal, O, to the depth of about one-half an inch within the receptacles formed above the mosaics and allow it to stand until all signs of dampness in the form of steam from the feeds or vents shall have disappeared.  
 110 By then depressing one corner of the platform and one corner of the mold, or bringing said mold to an incline, as indicated in Fig. 7, one feed becomes lower than the other or others, and the funnel which is lowest then becomes  
 115 the feed of the mold and all the others are vents, to allow the exit of hot air, &c. Into the feed I then pour the molten alloy of which I wish to form the frame-work of the mosaic. I pour slowly until the metal appears in all  
 120 the other vents or funnels and until it is level in all at the depth of about one-half an inch above the surrounding top or back metal. As soon as the metal in the funnels is cold, I remove the slabs of top or back metal by simply lifting them from their position and placing them in a pot for further use. The metal  
 125 cones which were formed in the funnels being removed from the frame of the mosaic, the casting process is completed. The mosaic is then thoroughly soaked in water, which softens the asbestos and gum still adhering to the surface, enabling their ready removal. The  
 130 glass is then cleaned and dried and is ready



for electroplating the metallic portion. The metal used as a top or back metal serves to hold the asbestos perfectly in place against the glass pieces of the mosaic, and in the present method the said top or back metal may be of lead or any cheap composition of base metals rather than the alloy used for the frame-work. Thus the more expensive alloy is saved and a much smaller stock thereof is required to be kept on hand. Inasmuch as the alloy of the frame-work metal cools under pressure, a perfect joining or union of parts is secured. Both sides of the metal frame-work are now given a heavy coating of copper-plate by any known process of electro-deposition. This is either left in its natural color, is oxidized, or otherwise colored to suit the demand.

In depositing the metal I prefer to allow it to overlap the edge of the glass, so that said glass is held more securely in place, and any slight blow-holes formed in the cast are filled, rendering the frame-work more perfectly impervious to wind and weather.

By disposing the mold with the glass pieces therein horizontally with the back or top metal on top vertically instead of edgewise, as heretofore, I obtain a more even pressure on the pieces from the molten metal, and thus secure a more uniform result.

The mold for casting horizontally can be employed outside of the manufacture of mosaics. For instance, I may make a channel in a thin layer of plaster resembling a design in wood or other material, and after the plaster is hard apply to the upper side thereof a layer or sheet of asbestos, and then cover the mold thus formed with a top metal and pour another metal into the channel in the plaster, and cheaply produce ornamental woods for album-covers, &c.

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

1. The mold for casting frame-works for mosaics, which consists of sheets I F, having turned edges to form a top-metal receptacle, and having interposed mosaic plates or pieces

arranged in a separated relation to receive the frame-work metal, substantially as and for the purposes set forth.

2. The improved mold for casting frame-works for mosaic plates or pieces, substantially as described, which consists of sheets of unflammable asbestos having mosaic pieces interposed therebetween, the said sheets having a back-metal receptacle formed on the upper side, and on said upper side having vents and feeds K, projecting up through said receptacle, substantially as and for the purposes set forth.

3. In a mold for casting frames around mosaic plates or pieces, the combination of sheets F I, adapted to receive mosaic pieces, vertical flanges J, forming a back or top metal receptacle, and back or top metal pressing down on said sheets, substantially as and for the purposes set forth.

4. In a mold for casting mosaics of glass, the combination of flexible sheets F I, bent at the edges, as at J, and feeds or vents K, substantially as set forth.

5. In a mold, the combination of flexible sheets F I, having flanges J and partitions L, substantially as and for the purposes set forth.

6. In a mold, the combination of sheets F I with interposed pieces separated from one another, back or top metal, O, perforated pieces G, and vents or feeds K, all said parts being arranged and combined substantially as and for the purposes set forth.

7. In a mold, the combination of the sheet F, wire C, mineral pieces arranged on said sheet F in separated relation to one another and to the said wire, a sheet, I, holding said wire and pieces in proper relation, flanges J, and vents and feeds, substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 27th day of April, 1887.

HENRY F. BELCHER.

Witnesses:

CHARLES H. PELL,

CONSTANCE H. BALDWIN.