

(No Model.)

3 Sheets—Sheet 1.

C. TOMPSETT.

APPLIANCE FOR ETCHING ON GLASS, METALS, &c.

No. 393,867.

Patented Dec. 4, 1888.

Fig. 1.

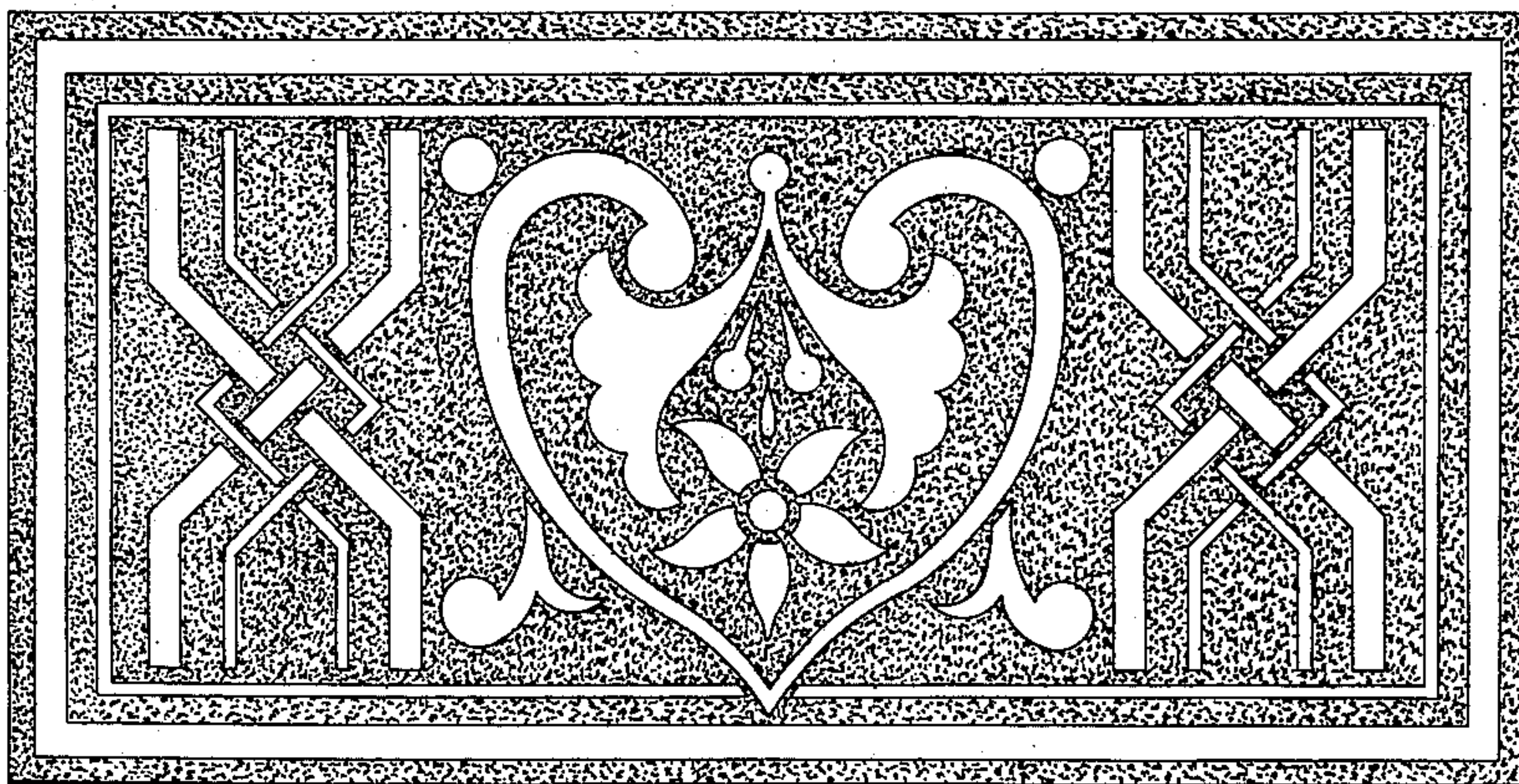


Fig. 2.

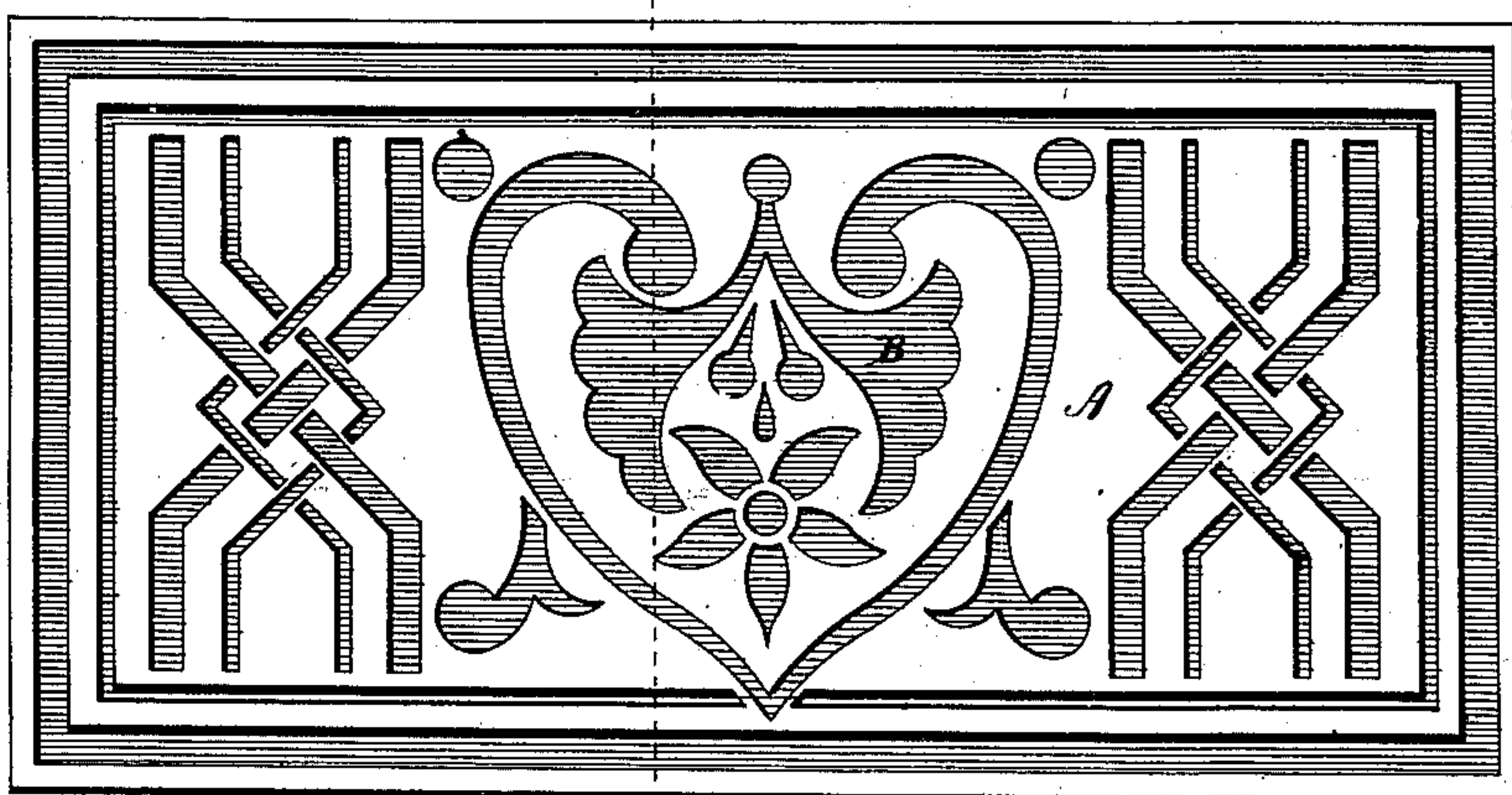
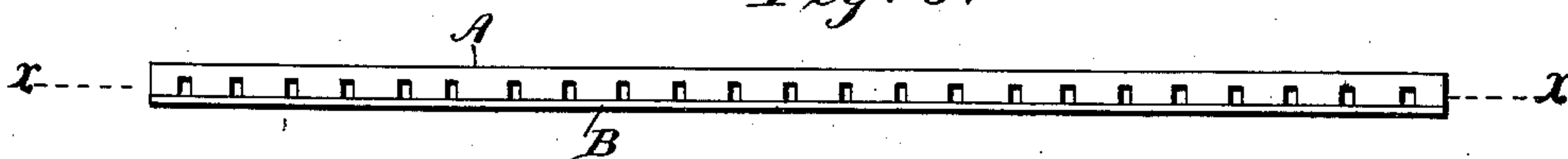


Fig. 3.



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Fig. 4.

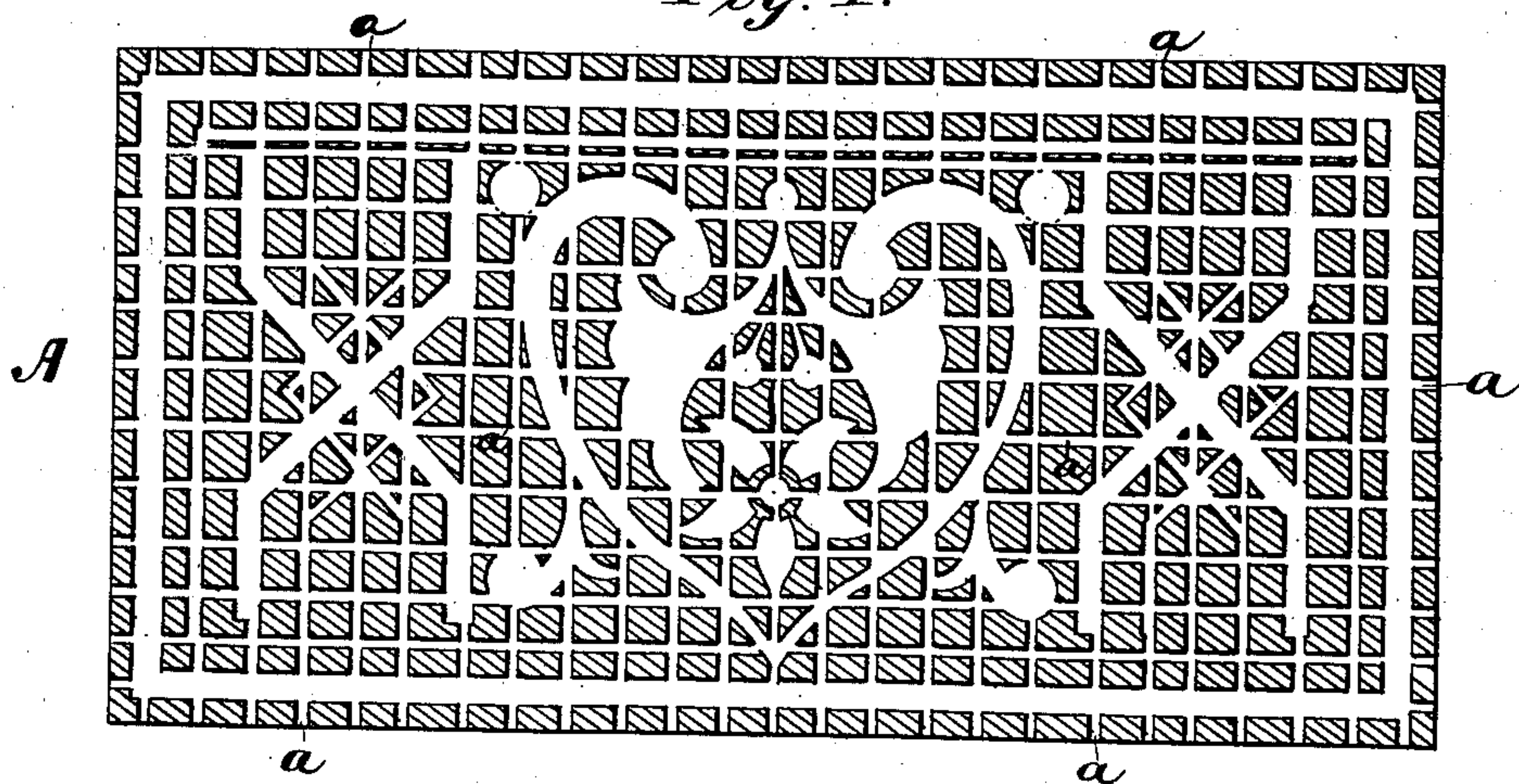


Fig. 5.

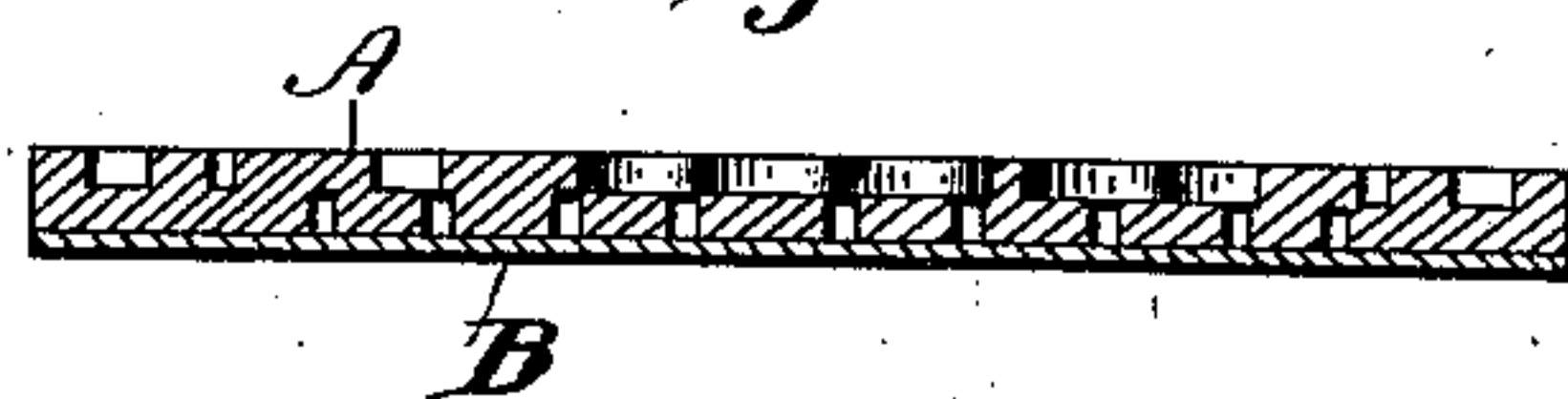


Fig. 6.

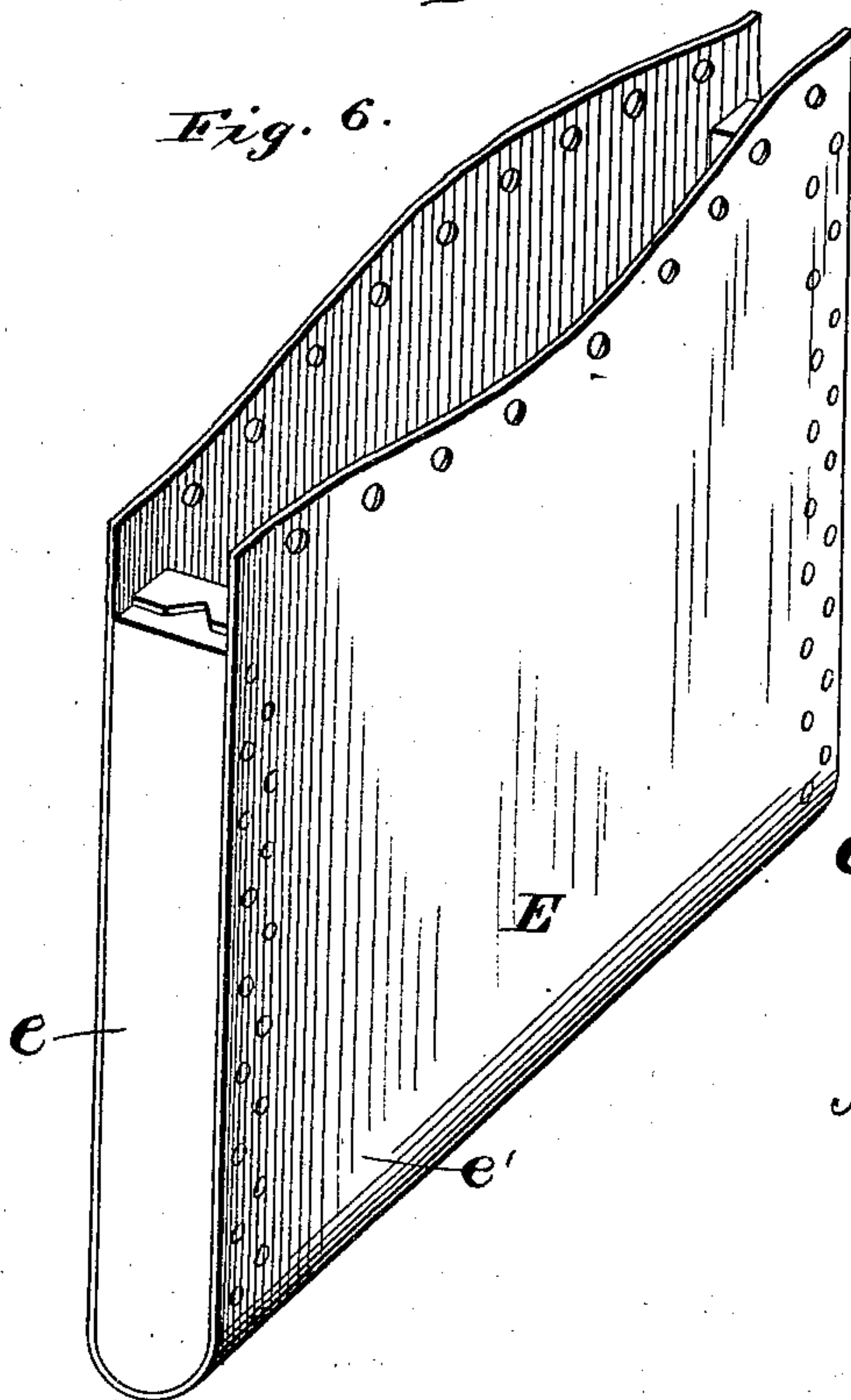
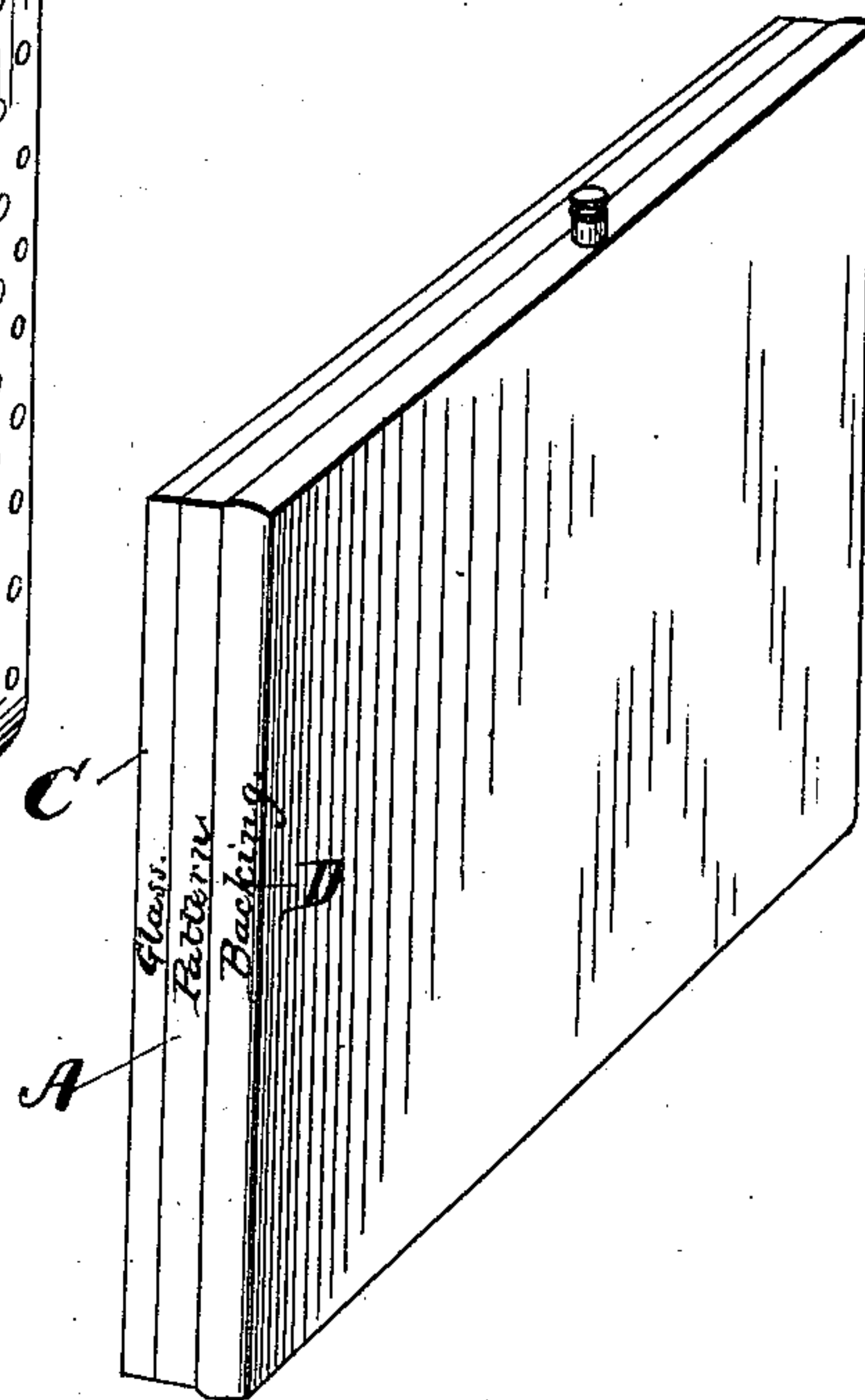


Fig. 7.



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Fig. 8.

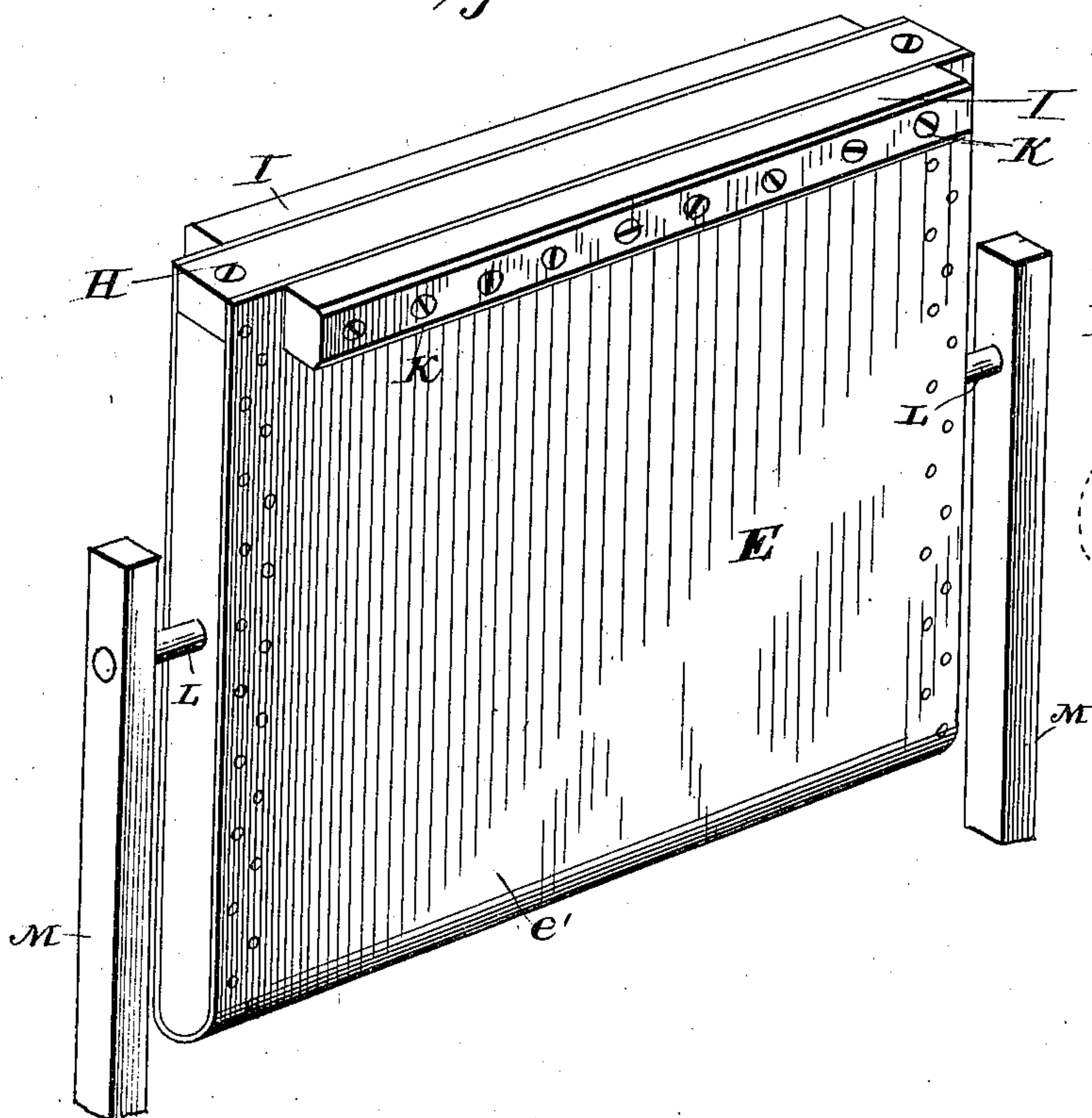


Fig. 9.

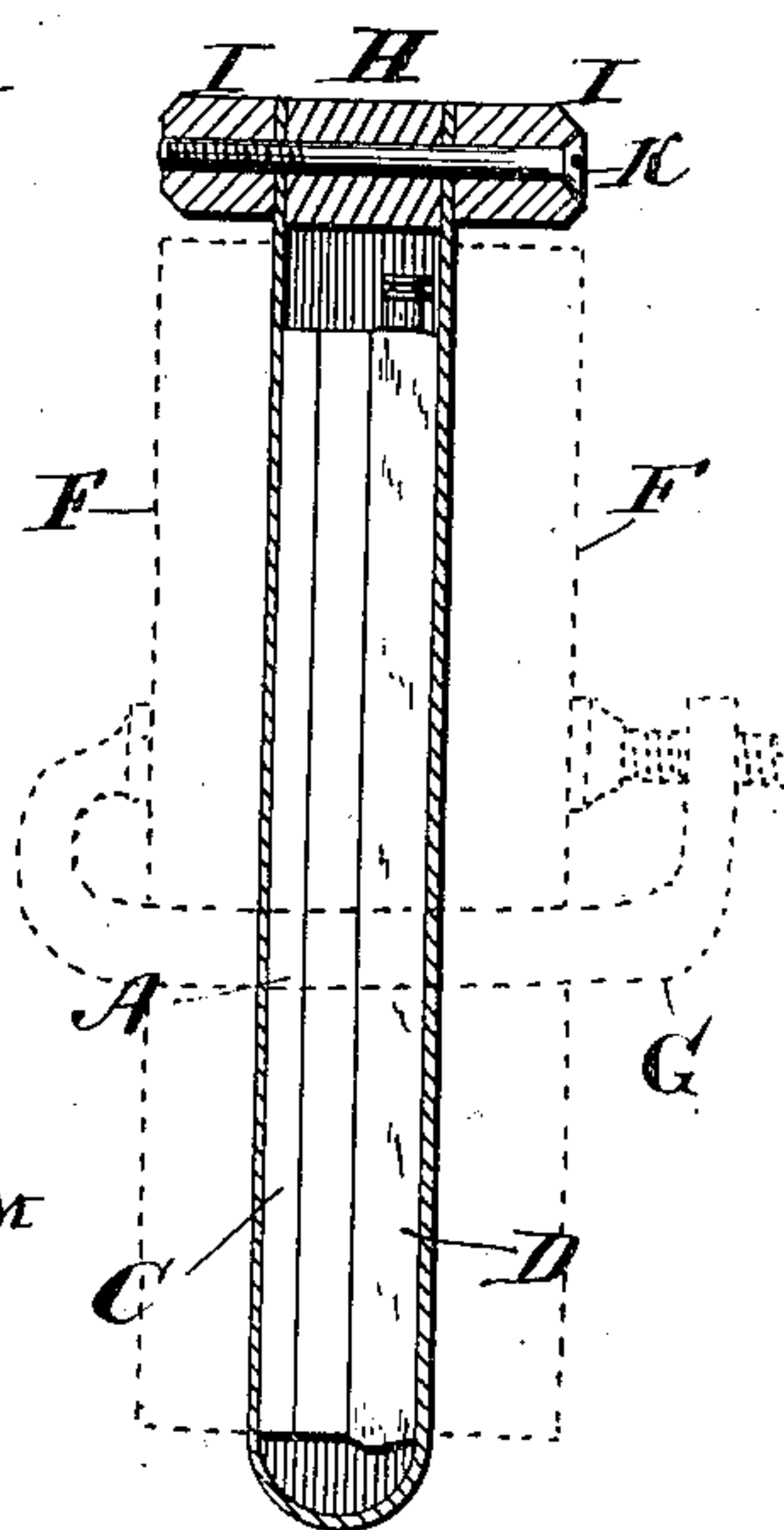
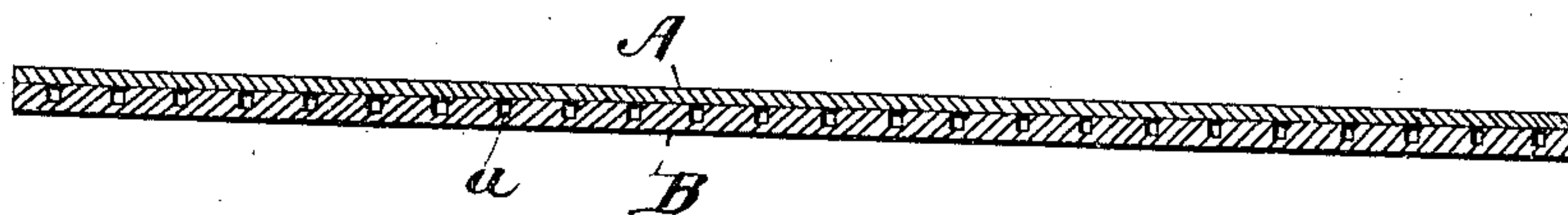


Fig. 10.



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UNITED STATES PATENT OFFICE.

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APPLIANCE FOR ETCHING ON GLASS, METALS, &c.

SPECIFICATION forming part of Letters Patent No. 393,867, dated December 4, 1888.

Application filed February 28, 1888. Serial No. 265,551. (No model.)

To all whom it may concern:

Be it known that I, CHARLES TOMPSETT, of Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Appliances for Etching on Glass, Metals, &c.; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

In the ordinary process of etching on glass or metals the surface to be etched is covered with a waxy or resinous ground, and the design is traced or cut out from said ground by an etching-point, after which the surface is subjected to the action of hydrofluoric or other acid, which acts upon the exposed portions of the glass or metal and eats or cuts away the same, thus making depressions which constitute the etching. In the practice of this process the ground has to be prepared for each surface to be etched, a step requiring in itself no small amount of attention, and great skill is required on the part of the operator who makes the pattern in said ground, from which it results that the process, as a whole, is somewhat delicate, requires specially-trained operators, and is expensive.

It is the object of my invention to greatly simplify the process of etching by providing patterns that are capable of being applied to a surface and removed therefrom and reused any number of times, said patterns being so constructed as that the parts of the surface not desired to be acted on by the acid shall be completely protected, while the exposed parts of said surface are all caused, through the provision of suitable circulating or conducting channels, to be properly and uniformly acted upon by the acid employed, all as will be hereinafter fully described.

In the accompanying drawings, Figure 1 is a view of a glass plate bearing a design etched into its surface by means of my improved appliances. Fig. 2 is a view of the face of the pattern employed in producing said design. Fig. 3 is an edge view of the same. Fig. 4 is a longitudinal sectional view taken on line *x* *x*, Fig. 3; Fig. 5, a cross-sectional view taken on the line *y y*, Fig. 2. Fig. 6 is a perspective view of the receptacle in which the glass

plate and pattern are placed and confined while being subjected to the action of the acid. Fig. 7 is a view of the glass plate, the pattern, and the backing-pad for the pattern, showing how they are assembled before being placed in the receptacle. Fig. 8 is a view of the receptacle when closed and clamped; Fig. 9, a cross-sectional view of the same. Fig. 10 is a sectional view of a modification of the pattern.

Similar letters of reference in the several figures indicate the same parts.

The letter A indicates the pattern, which is made of a material not affected by acid, which is preferably flexible and adaptable so as to fit closely against the surface to which the pattern is applied. India-rubber answers the purpose admirably and is the material which I preferably employ. The pattern has cut or otherwise formed in it the design which it is desired to transfer to the surface to be treated, and at its rear portion channels or passages *a* are provided for admitting a free circulation of the acid employed to all parts of the design, as shown in Fig. 4. These channels may either be formed in the rear of the face portion or pattern proper, as shown in Fig. 5, or in a backing, B, behind said face portion of pattern proper, as shown in Fig. 10, or otherwise, the only essential point to be observed being that they are numerous enough and properly disposed so that all portions of the pattern will be reached by the acid.

The backing B, which is preferably, though not necessarily, made of the same material as the face portion of the pattern, is preferably connected to or formed integral with said face portion or pattern proper, so that the two can be handled together as a single article, and the channels for the circulation of the acid, whether made in the face portion or in said backing, extend out to the lateral edges of the pattern, as shown in Fig. 3, so as to admit of the introduction of the acid, as will presently be described.

I will now explain one way of practically using my improved patterns in etching a design on a glass plate and by the use of certain simple instrumentalities such as have been found practical by actual trial. The face of the pattern is brought in contact with the surface of the glass plate, (lettered C in the

drawings,) and behind the backing B of the pattern is placed a very flexible and adaptable pad, D, which may consist of properly-treated cloth or fibrous material, or, better
 5 still, of a flexible rubber water-bag, as shown in Fig. 7, after which these several parts are inserted together edgewise into a receptacle, E, composed of wooden rubber-coated ends *e* and sides and bottom of flexible rubber *e'*, as
 10 shown in Fig. 6. This being done, suitable boards or plates, F, are applied to the sides of the receptacle, and the receptacle and contents are clamped tightly between them by means of suitable clamps, G, as shown. The
 15 acid solution, of suitable strength, is then poured into the channels *a*, which causes said acid to pass down and into contact with all the exposed surfaces of the glass opposite the openings of the pattern. When the pattern
 20 is "flooded," so to speak, a rubber-covered bar, H, is applied to the top of the receptacle, and then clamping-bars I I and screws or equivalent fastenings K complete the closing of the mouth of the receptacle.

25 The complete closing of the receptacle is rendered desirable, if not necessary, in order that the contained glass and pattern may be turned upside down or reversed, so that the action of the acid may be rendered more effective and uniform at all portions of the design.

To facilitate the turning of the receptacle, it may be provided with central pivots, L, and mounted in a frame, M, so as to be capable of
 35 rotation, if desired.

After the acid has acted a sufficient time the receptacle is opened and the parts removed. Upon separation of the pattern from the glass plate an exact counterpart of the design on the pattern will be found etched on
 40 the surface of the glass, and the latter may then be ground or treated in any other way, as in the case of plates etched by the ordinary process.

45 The same pattern may be used time and again without deterioration, and a number of plates and patterns may be assembled and treated at once to the action of the acid, thus rendering it practicable to produce etched
 50 plates not only better and cheaper than by the old process, but in much less time and by unskilled persons, since nothing more is required of the operator than to see that the proper intimacy of contact between the pattern and the plate is secured and that the action of the acid is continued for the proper length of time.

The object of employing the water-bag or other pad behind the pattern is to insure the
 60 pressing of the entire face of the pattern against the surface to be treated, and is of course more necessary where designs are to be applied to ordinary glass, which has seldom, if ever, a true surface.

65 Care should be taken in making the channels for conveying the acid to the different parts of the pattern to see that the remote

portions of the patterns, particularly the extreme upper and lower points of said portion, are provided with channels, as a failure to do
 70 this will cause air to be confined at such points and prevent access of the acid thereto.

A pattern of flexible material such as hereinabove described, having a design cut or otherwise formed in it, but without the separate channels for the acid, would of course
 75 possess the merits of removability and adaptability to the surface to be etched and would fall within my invention to that extent; but such a construction would be inferior to the
 80 channeled pattern, because of the difficulty in applying the acid.

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

1. An etching-pattern having a design
 85 formed in its face and having channels at the rear for conducting acid to the parts of the design, substantially as described.

2. An etching-pattern of flexible material having a design formed in its face and having
 90 channels at the rear for conducting acid to the parts of the design, substantially as described.

3. An etching-pattern of india-rubber having a design formed in its face and having
 95 channels in the rear for conducting acid to the parts of the design, substantially as described.

4. An etching-pattern consisting of a face portion having a design formed therein and
 100 a backing with channels between said backing and face portion leading to the different parts of the design, substantially as described.

5. An etching-pattern consisting of a face portion having a design formed therein and
 105 a backing secured to or formed integral with said face portion and having acid-conducting channels, substantially as described.

6. An etching-pattern consisting of a face portion having a design formed therein and
 110 channels in the rear leading to the parts of the design and a flexible backing, substantially as described.

7. An etching-pattern consisting of a flexible face portion having a design formed therein and a flexible backing with channels between
 115 said backing and face portion, substantially as described.

8. The combination, with the pattern consisting of the face portion having the design
 120 and the flexible backing with the channels between the two, of the flexible backing-pad and means, substantially as described, for clamping the pattern and pad to the plate or surface to be etched.

9. The combination, with a pattern, substantially such as described, of the receptacle
 125 for holding the acid solution and the clamping instrumentalities operating upon the side of the receptacle to clamp the plate and pattern together, as set forth.

10. The combination, with a pattern, substantially such as described, of the receptacle
 130 for holding the acid solution, the flexible back-

ing-pad, and the clamps operating upon the outside of the receptacle, substantially as described.

11. The combination, with a pattern, substantially such as described, of the elastic receptacle, appliances, substantially as described, for closing the mouth of the same, the flexible backing-pad, and the clamps operating on the outside of the receptacle, substantially as described.

12. The combination, with a pattern, substantially such as described, of a receptacle having the end pieces, the flexible bottom and sides, and the removable mouth-piece, clamp-

ing-strips, and screws, substantially as described.

13. The combination, with a pattern, substantially such as described, and the clamping devices, of the receptacle mounted in suitable bearings, whereby said receptacle and contents may be inverted while the acid is etching the surface being treated, substantially as described.

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