

A. C. ESTABROOK.

Manufacture of Brushes.

No. 135,415.

Patented Feb. 4, 1873.

Fig. 1.

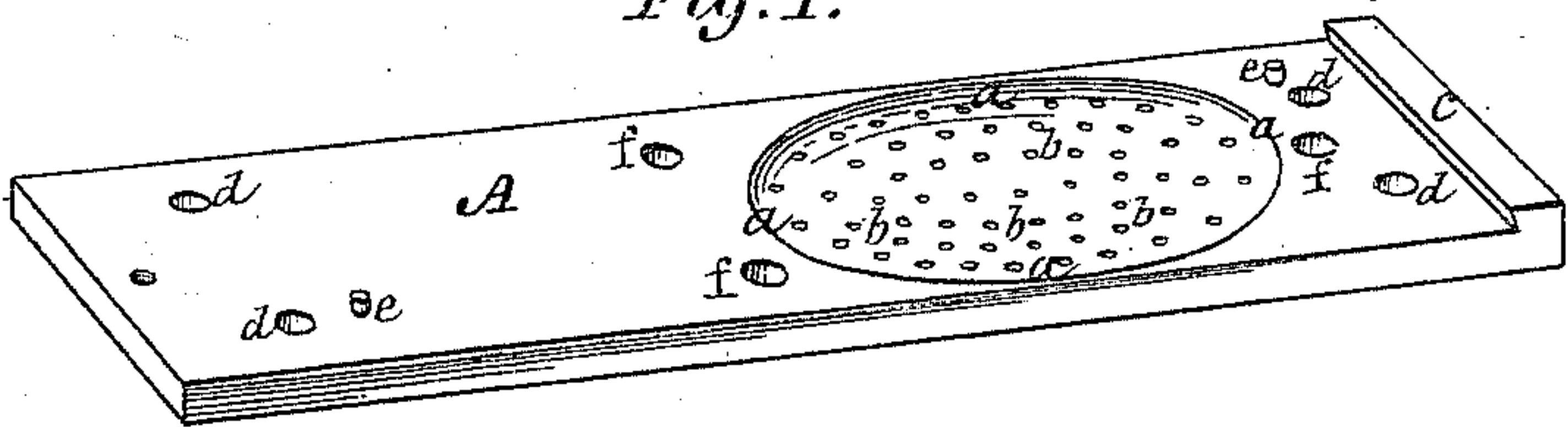


Fig. 2.

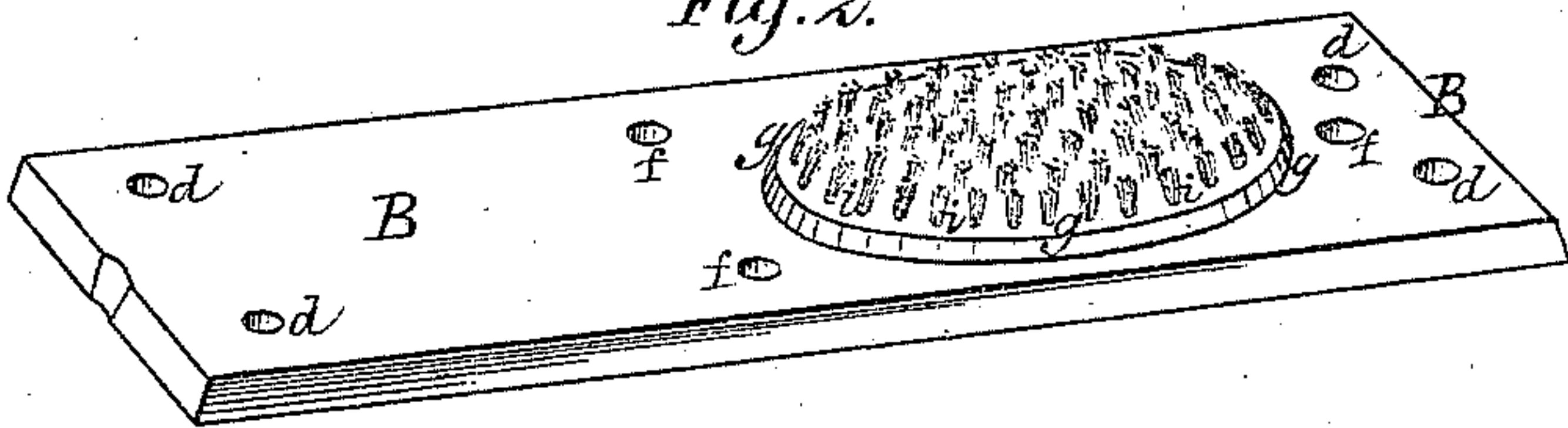


Fig. 5.

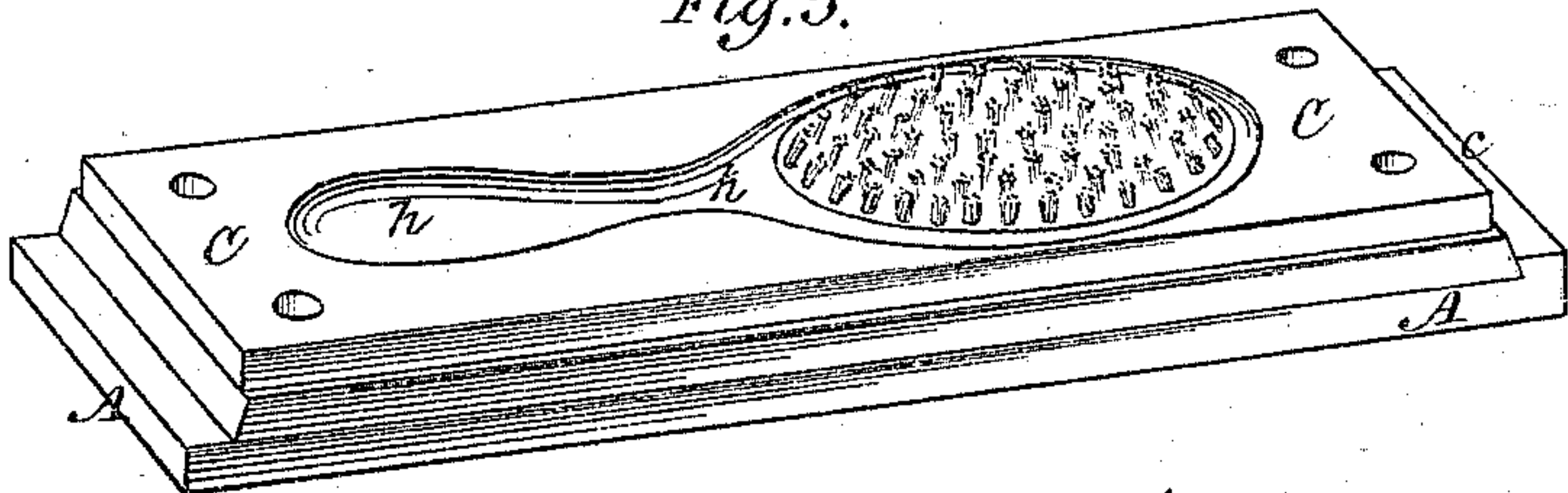


Fig. 6.

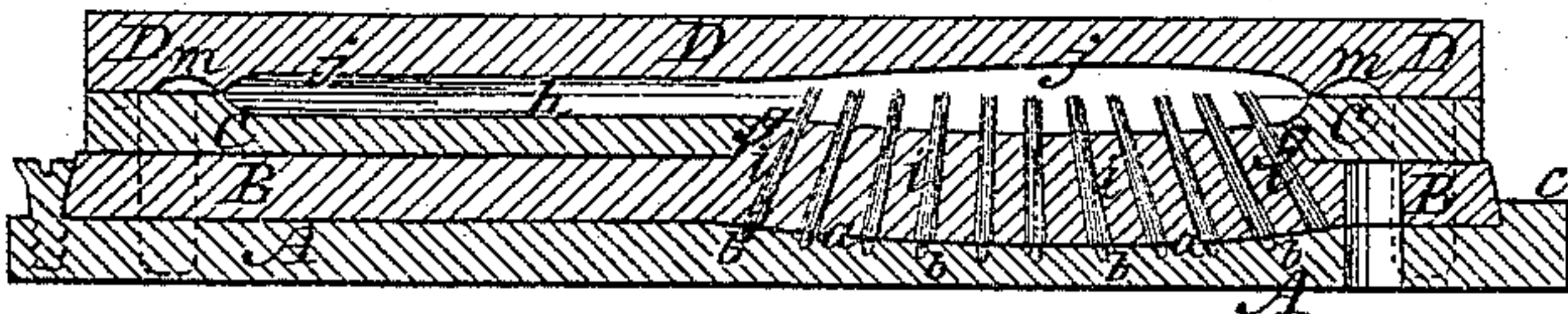


Fig. 7.

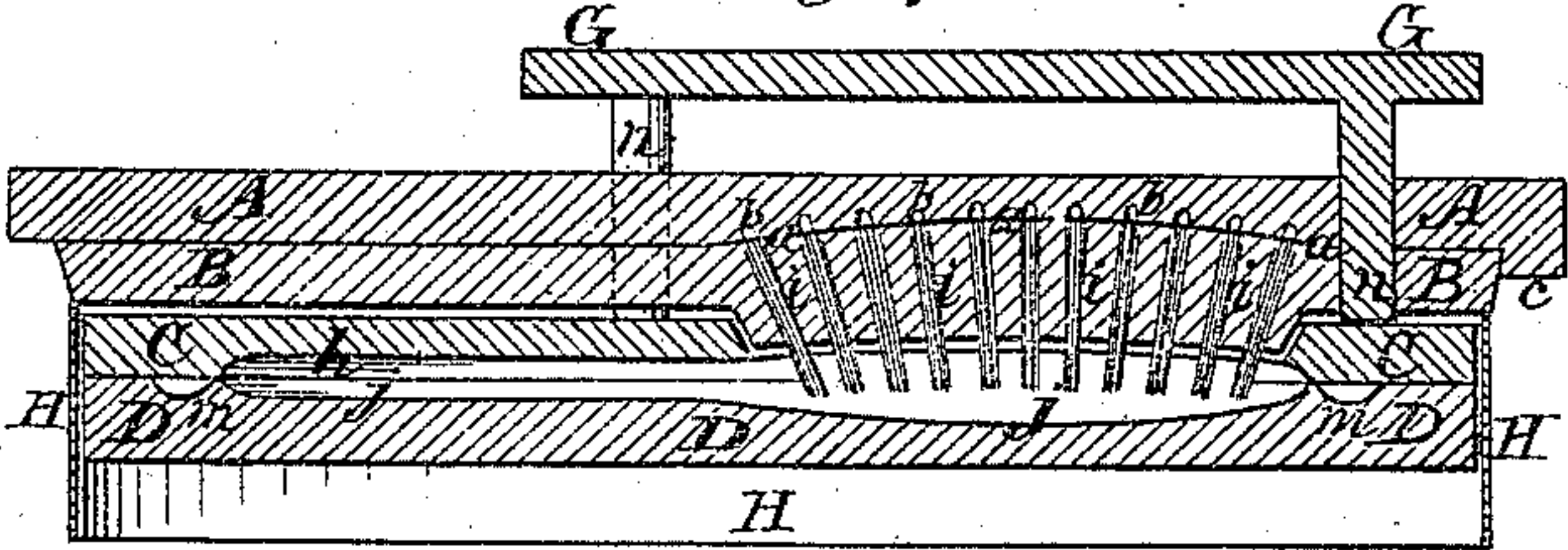


Fig. 3.

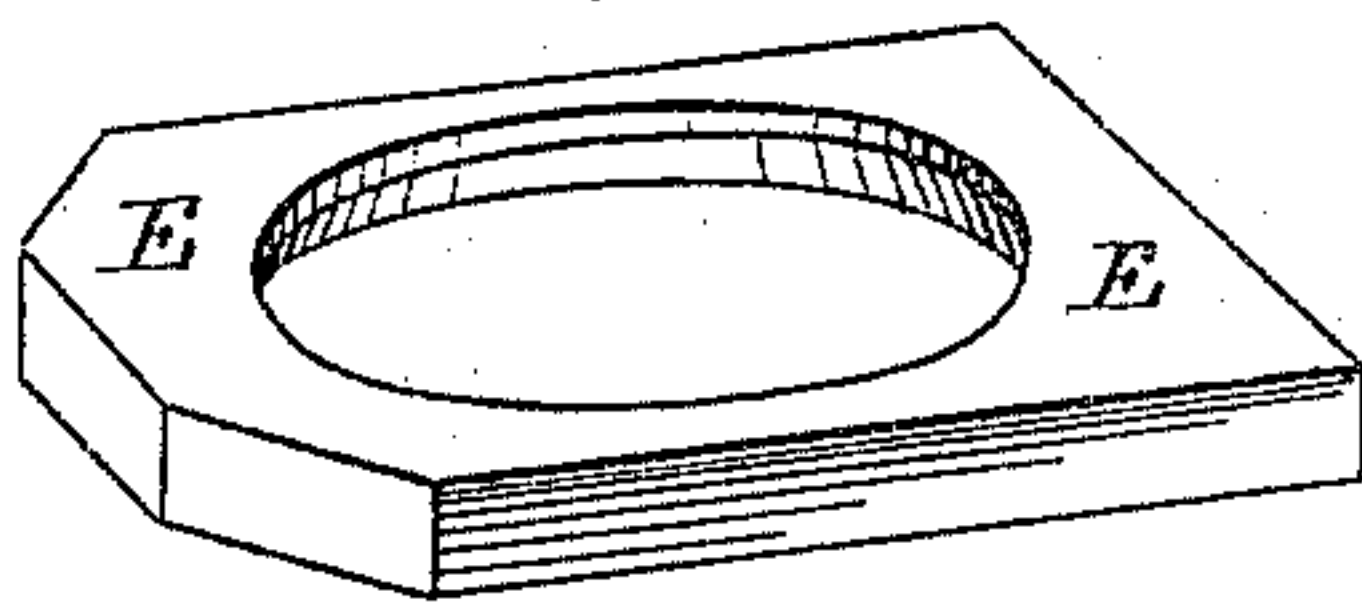
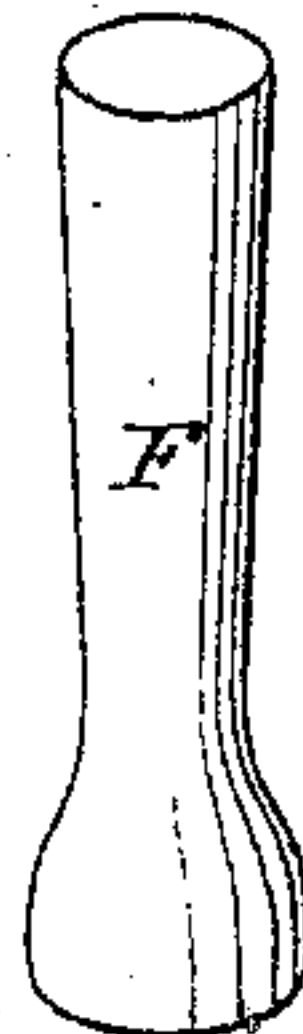


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALANSON C. ESTABROOK, OF FLORENCE, MASSACHUSETTS, ASSIGNOR TO
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IMPROVEMENT IN THE MANUFACTURE OF BRUSHES.

Specification forming part of Letters Patent No. 135,415, dated February 4, 1873.

To all whom it may concern:

Be it known that I, ALANSON C. ESTABROOK, of Florence, in the county of Hampshire and State of Massachusetts, have invented certain new and useful Improvements in the Manufacture of Brushes; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 represents in perspective the under one of a series of plates, dies, molds, or formers, for facilitating the arrangement of the bristles and for securing them in a proper position in a plastic brush-back, and for removing the finished brush therefrom. Fig. 2 represents, in perspective and detached, the next or second plate, die, mold, or former, of the series. Figs. 3 and 4 represent in perspective pieces that are temporarily used in connection with the piece shown in Fig. 2. Fig. 5 represents in perspective a third section or piece lying upon the top of those shown respectively in Figs. 1 and 2. Fig. 6 represents a vertical longitudinal section through the series of pieces that constitute the die, mold, or former, showing the bristles in place, and the space wherein the plastic back is formed and united to the bristles. Fig. 7 represents in similar section the parts or pieces shown in Fig. 6, but inverted, and a ring or band and a follower added thereto to facilitate the removal of the finished brush from the die, mold, or former.

Similar letters of reference where they occur in the separate figures, denote like parts in the drawing.

My invention has for its object the production of a brush finished as to length, position, convexity of surface, and "penetration" of the bristles in a die, mold, or former, as will be explained; and my invention consists, first, in the construction of the members or sections which constitute the die, mold, or former; second, in the joint action or co-operation of the aggregated sections for facilitating the process of forming the back and handle of the brush, and of uniting said back and handle to the bristles; third, in the devices and opera-

tion for removing the finished brush from the die, mold, or former, without liability of breaking or injuring it.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawing.

The under or base piece, or bed-plate A, Fig. 1, has an oval concavity or recess, *a a a*, in it as shown, but which may be round or of any other shape and form that it is desired to give to the bristles in, or to, the brush; and in this recess are made a series of small holes, *b b b*, into and around which some of the bristles of the tufts rest, thus making their ends uneven or giving them penetration, as it is technically termed, as will be explained hereafter. With the addition of the guide *c*, dowel or pitch pin holes *d*, dowels *e*, and follower-holes *f*, this bed-plate is complete.

The second plate or piece B, Fig. 2, has upon its under side, and, as shown in Fig. 6, a convex, oval, or other shaped projection, but made to fit into the concavity or recess *a a* of the bed-plate A, whatever the form of that recess may be. Upon the upper side of the piece B there is formed an oval projection, *g*, with a concave surface, so as to make that surface parallel, or nearly so, with the projection on its under side, and which is distinctly seen in the sectional figures at 6 and 7. Through the projection *g*, and through the plate or piece B, are made a series of holes, *i i*, larger in diameter than, but in line with, those *b* in the bed-plate A; and these holes are inclined, and may point to a common center, so that the bristles placed in them and afterward united to the brush, may be inclined or radial, though they may be straight, if so preferred. The holes *i* being larger than those *b*, and large enough to contain a tuft of bristles, leaves or forms a shoulder around said holes *b*, upon which some of the bristles of the tuft will rest, while others will drop into the holes *b*, thus making the ends of the bristles of each tuft uneven, giving to them what is technically called penetration—that is, the facility of better penetrating the hair. And while this irregularity of the ends of the bristles is attained, their general contour is uniform, and the

length of the bristles projecting from the brush-back is also uniform. With the addition of the dowel-holes *d*, follower-holes *f*, and holes in its under side to receive the small dowels *e* of the base-plate, this completes the plate or piece B.

The next or third piece in order is that C, Fig. 5, it being shown as overlying the other pieces A B, above described. This piece C has, first, an opening clear through it, which opening receives the projection *g* of the piece or plate B, and allows the projecting ends of the tufts of bristles to extend up through said opening, and far enough through to receive the material of which the brush or its back is composed, and which unites the ends of the bristles to said back. The upper margin of this opening is beveled or recessed to form a mold for the edge of the brush back, and from one end of this opening, on the upper side of the piece C, extends a recess, *h*, in which one-half of the handle of the brush is molded, shaped, and formed. This piece C is also furnished with dowel-holes *d* corresponding with those in the other pieces A B, and so that the dowels or pitch-pins will pass through them all, thus holding them all in proper position.

The top and last piece or plate is shown at D, Figs. 6 and 7. This plate or piece D has a mold or recess, *j*, formed in its under surface, and which is so shaped as to receive the material for, and form one-half of, the back and handle of the brush—the other half or part being received in the piece C, which underlies that D. From the under side of this piece D project dowel or pitch pins, which, passing through the holes *d* in the pieces C B, and thence into seats in the base-plate A, unite and hold the several members of the die, mold, or former in proper position or matched; and when in the position shown in Fig. 6, and the material that is to form the back and handle of the brush occupies the space therein shown, the incipient brush is subjected to high pressure in the die, mold, or former; and when ready to be removed is taken out, as will be explained.

Among the many advantages of this die, mold, or former, and the process of making brushes therein, I may mention the following: Short tufts of bristles may be used; the necessary penetration is readily and uniformly given to the ends of the bristles, in placing them in the tubular block; and the pressure necessary for putting a finish upon the brush back and handle, does not come upon the bristles, and which, if it did occur, would bend, break, or crimp them.

To form a brush in the die, mold, or former, I proceed as follows: The piece B is properly placed on the base-piece A, its beveled edge abutting against the gage *c* to give it right position. The holes in B are now filled with bristles, some of which drop into the smaller holes in A, the other resting upon A at and

around said small holes. These bristles or tufts extend up through the projection *g* on the plate B far enough to be strongly embedded in the plastic material that forms the back of the brush. The pieces A B, being so placed, and the holes filled with bristles, as stated, a piece, E, Fig. 3, is placed on B, its opening receiving the projection *g*, and the bristles extending through and above it. Some of the plastic material of which the back is composed having been warmed and softened is pressed in upon, around, and over the projecting ends of the bristles—the opening in E forming a guide or ring therefor. In this condition the mold and incipient brush may be set aside to dry or harden; first using, if necessary, the rammer F, Fig. 4, for gently but firmly crowding the material down, around, into, and against the bristles. When sufficiently dry and hard, the piece E is removed, and the piece C is laid upon the piece B, and the composition being warmed and softened over a spirit-lamp, so that the additional material required to fill out the back and form the handle will unite with it, the plastic material enough to fill the mold is laid on, and the top part D being laid on, the die, mold, or former is removed to a press, where the operation is completed—the pressure in the heated molds giving the luster and polish to the surface of the composition. The molds may be engraved or ornamented, so as to give a counterpart thereof to the brush-back and handle.

When the brush is to be removed from the die, mold, or former, a ring or band, H, is placed around the pieces C D and resting upon the piece B. The whole thing is then turned upside down, as shown in Fig. 7. The piece G, having pins *n* thereon, which fit and pass into and through the holes *f* in the pieces A B, comes against the piece C, as seen in Fig. 7; then, by letting the die, mold, or former drop upon a table or other thing, with the ring or band still united, and at the same time pressing gently with the fingers upon the piece G, the mold separates at the juxtaposition of B C, and the bristles draw out of the holes *i*, and the finished brush is left between C and D, and by removing C can be lifted out.

I have mentioned holes only for containing the bristles in the formation of the brush, but I can, and propose to use, grooves or corrugations in which the bristles may be arranged and held, as well as the penetration attained. The molds are warmed during the process of applying the composition that forms the back and handle of the brush, and of pressing said material to give it a polished surface.

Having thus fully described my invention, what I claim, is—

1. The combination of the base-piece A and the plate B, with their recess and projections, and holes *i* *b*, for placing, holding, and giving penetration to the bristles, substantially as described.

2. A die, mold, or former, for making brushes in, composed of the members A B C D, acting together in the manner and for the purpose described and represented.

3. In combination with the die, mold, or former for making brushes in, the piece G, with its projections *n n*, for separating the parts A B from those C D, for the purpose of taking out the finished brush, substantially as described.

4. In combination with the die, mold, or former, and the piece G, for separating them, the band or ring H for holding together the two parts that contain the brush, as and for the purpose described.

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Witnesses:

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