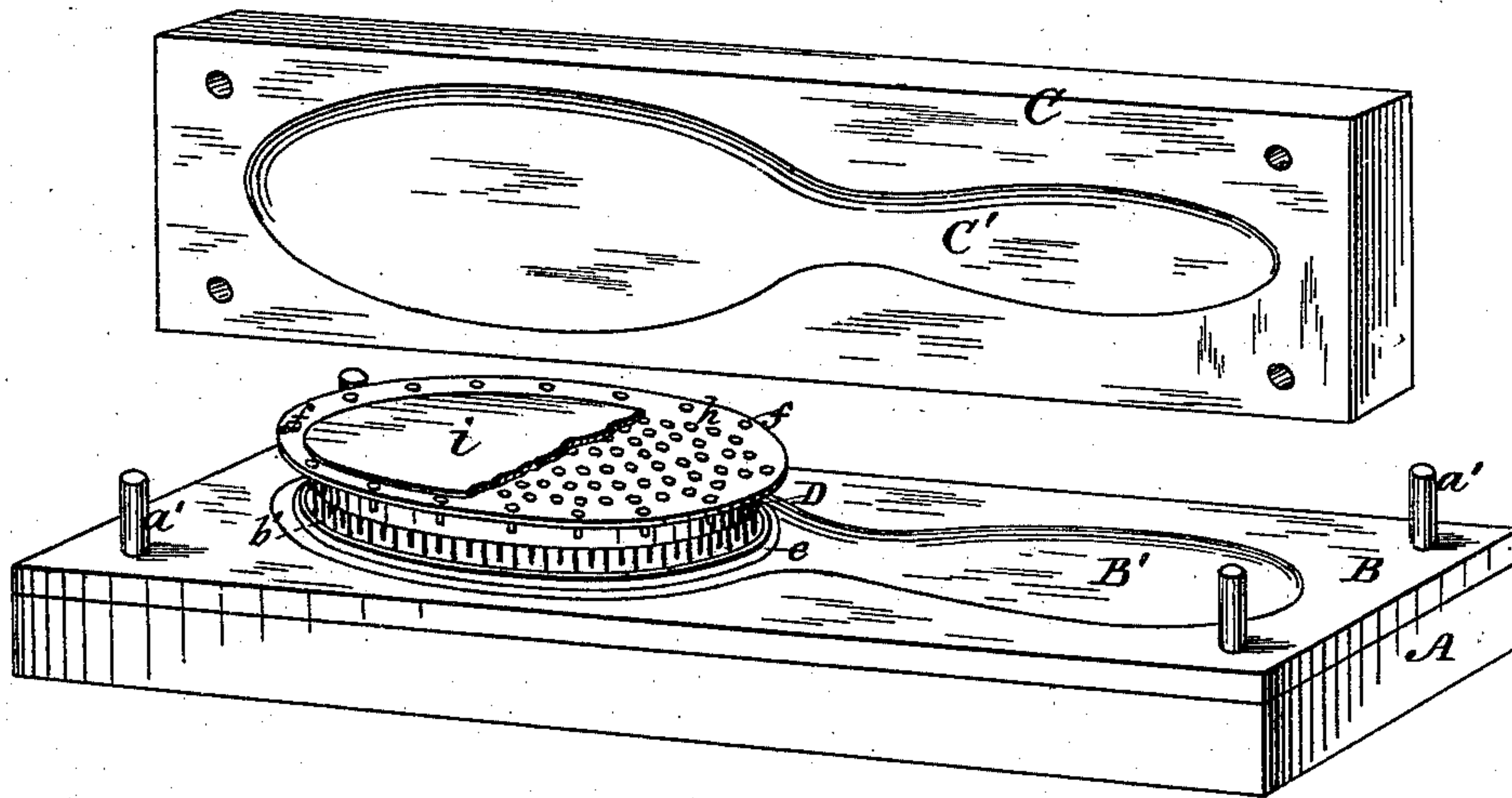


A. C. ESTABROOK.  
 Manufacture of Rubber Backs for Wire Brushes.

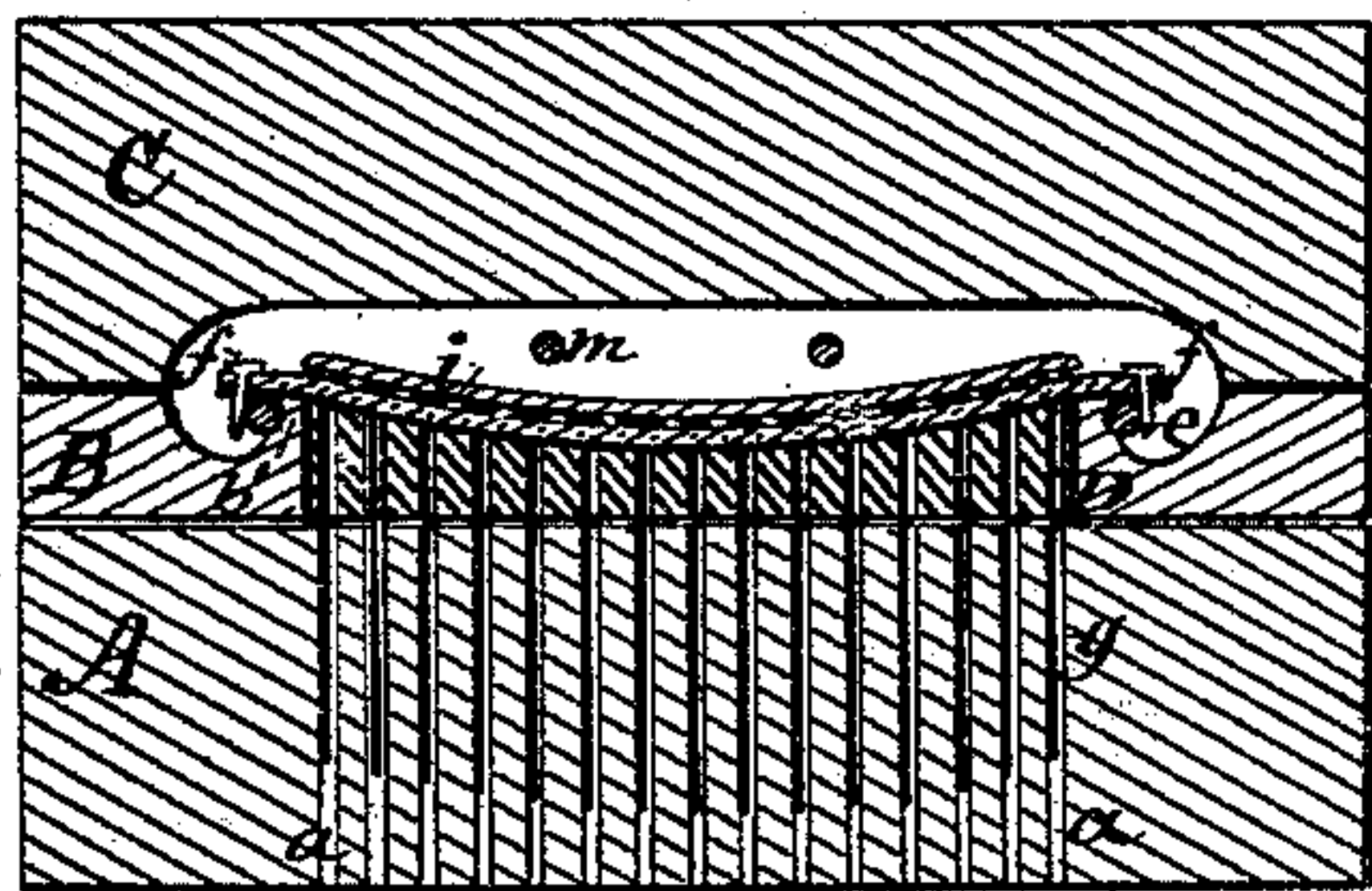
No. 223,844.

Patented Jan. 27, 1880.

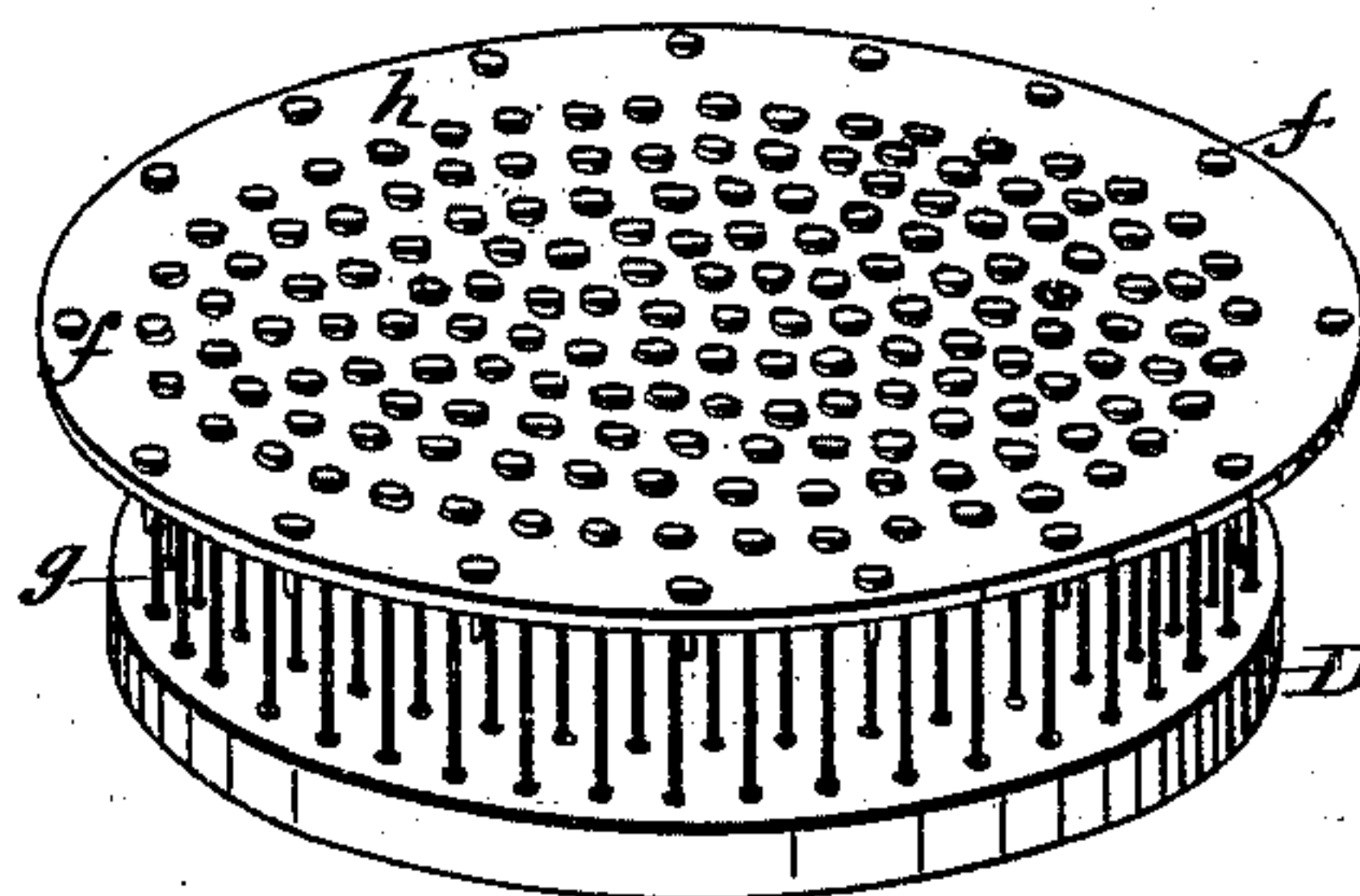
*Fig. 1.*



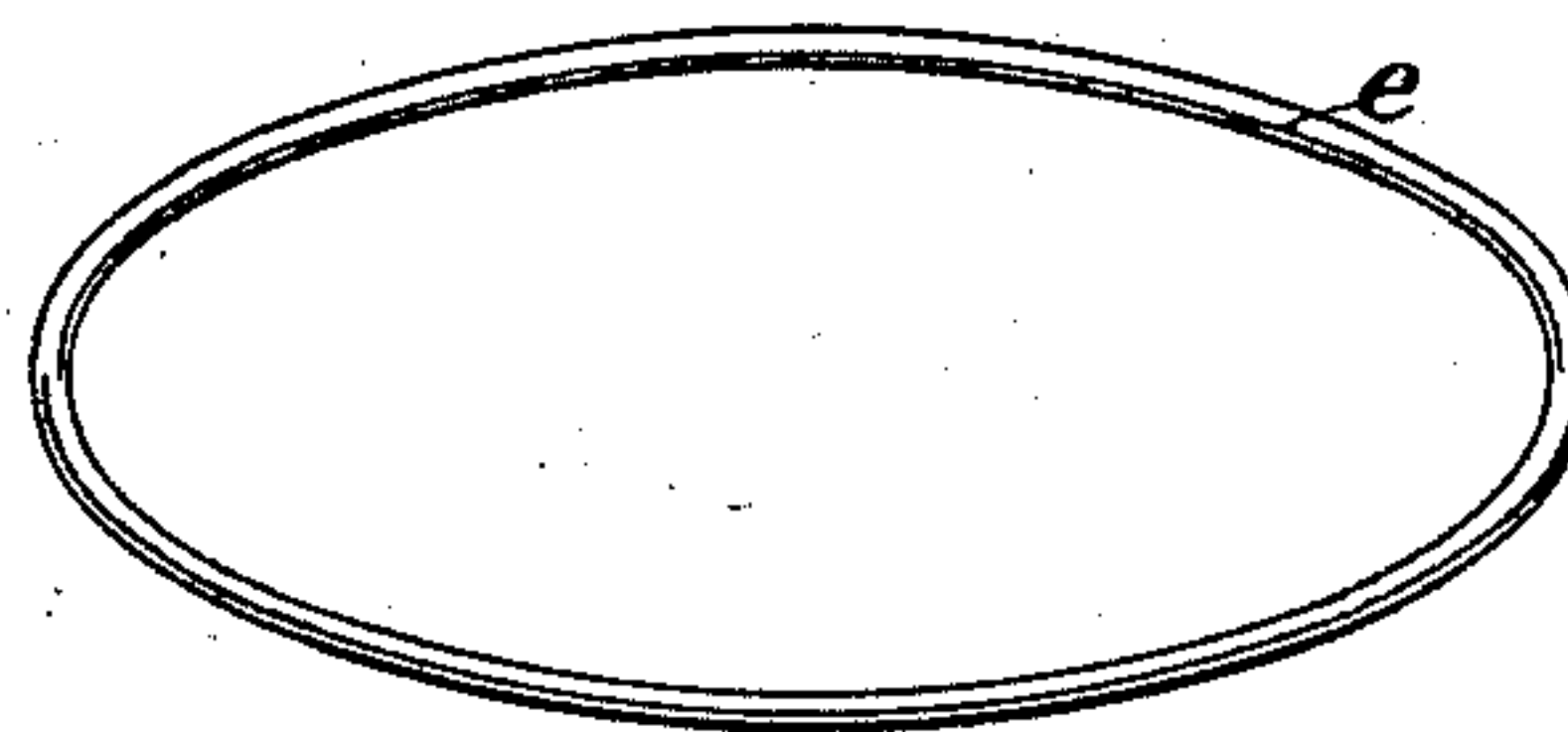
*Fig. 2.*



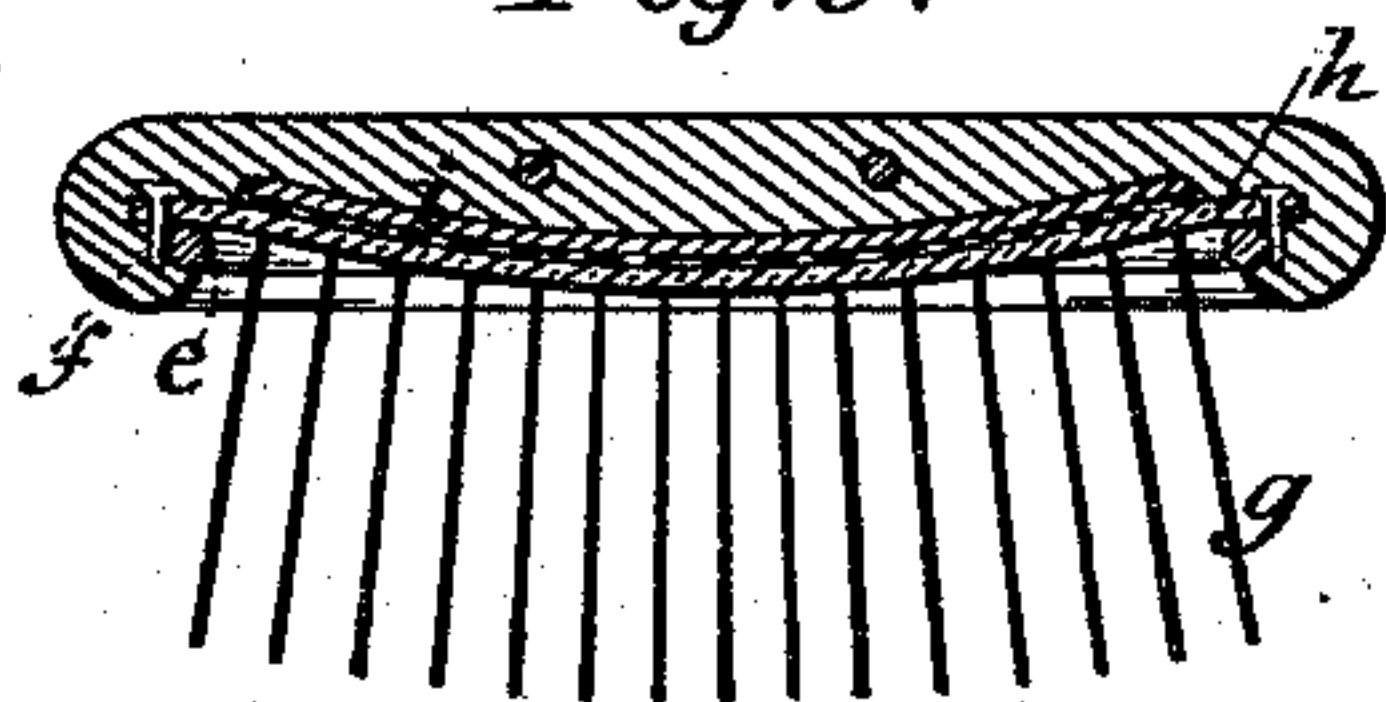
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



*Witnesses:*

*W. B. Masson*

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*Alanson C. Estabrook*

*by E. E. Masson*  
*att'y*



# UNITED STATES PATENT OFFICE.

ALANSON C. ESTABROOK, OF NORTHAMPTON, MASSACHUSETTS, ASSIGNOR  
TO FLORENCE MANUFACTURING COMPANY, OF SAME PLACE.

## MANUFACTURE OF RUBBER BACKS FOR WIRE BRUSHES.

SPECIFICATION forming part of Letters Patent No. 223,844, dated January 27, 1880.

Application filed April 14, 1879.

*To all whom it may concern:*

Be it known that I, ALANSON C. ESTABROOK, of Northampton, in the county of Hampshire and State of Massachusetts, have  
5 invented certain new and useful Improvements in the Manufacture of Rubber Backs for Wire Brushes; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to  
10 the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a perspective view of the dies, in which they are shown as separated, to exhibit the central wire-holding block  
15 and other parts used in the construction of the brush. Fig. 2 represents a transverse vertical section of the same on a larger scale, and closed or united. Fig. 3 represents a perspective view of the elastic sheet of rubber in  
20 which the headed wires are inserted, and also the small block through which the point of each wire is passing. Fig. 4 represents a view of a metal ring used in the construction of the brush. Fig. 5 represents a transverse section  
25 through the completed brush.

My invention relates to toilet-brushes in which wires are substituted for the ordinary bristles.

In brushes of this class one of the main difficulties has been to properly unite the soft  
30 and elastic rubber holding the wires to the unyielding back of the brush, so as to form a strong and durable union of the parts, and the other has been for means to expedite its  
35 manufacture and give a tasteful appearance to the brush when completed.

Heretofore the sheet of elastic rubber retaining the wires has generally been tacked or screwed to the back, either under it, above  
40 it, on its edge, or in a groove formed in these parts, or sewed or riveted to a metallic rim, also screwed to the back; but neither fulfills the object that I have in view. This object  
45 is to construct a wire brush in which the soft-rubber sheet holding the wires is united to a composition back by means of a metal ring and stay-pins inclosed in said composition, and by the use of dies peculiarly formed for the purpose.

50 My invention consists in a wire brush hav-

ing a composition handle and soft-rubber backing, united together by stay-pins resting against a metal wire embedded within said composition.

It consists, also, in the means employed to  
55 embed the stay-pins in the soft-rubber and composition back, and also the metal ring, by means of dies peculiarly hollowed, grooved, and perforated for this purpose, as will be hereinafter more fully explained. 60

In the drawings, A represents the bottom piece of the dies. It is a rectangular piece of metal, having holes *a* drilled entirely through it, as shown in Fig. 2, for the reception of the  
65 wires of the brush, and this piece A is thick enough to keep the wires from projecting through it and becoming bent while the brush is subjected to pressure. Upon the piece A is placed the middle piece or die, B. It is hollow in its upper side at B', to form the under  
70 side of the back and handle of the brush, and it has a large central opening of the configuration adapted for the brush-block D, and made for its reception. Around said central opening there is a groove, *b*, made to receive  
75 the metal ring *e*, a series of stay-pins, *f*, and a portion of the composition forming the back of the brush, the projecting rim *b'* retaining the ring in position, and also the composition forming the rim of the back. 80

The top piece, C, of the dies is hollowed in its under side, at C', to form, when filled, the upper side of the back and handle of the brush. This may be ornamented to any extent desired. The bottom piece, A, has a dowel,  
85 *a'*, at each corner, which extends through corresponding holes in the dies B and C, for the purpose of keeping the parts of the dies in the same relative position while being subjected to pressure. 90

The brush-block D is a small perforated block having the same number of holes as there are in the bottom piece, A, and as there are wires forming the brush. It is used to keep the wires *g* in position and sustain the  
95 soft-rubber backing *h* when the brush is pressed. The upper side of this perforated block, as it is placed in the die, is concave, for the purpose of giving an oval shape to the brush at the points of the wires, and also to incline 100



the latter so as to present a larger surface at the points than at the place where they pass through the elastic rubber backing.

The wires *g* are made of ordinary wire of the desired size, with an oval point, not too sharp, and with a head at the other end. The top of the head of each wire is made flat, to present a broader bearing to the pasteboard cushion *i* placed above them.

The rubber backing *h* must be elastic and of sufficient strength to keep the wires in position securely. This rubber *h* is cut of the proper shape and of sufficient size to extend beyond the outer line of wires which form the brush, and to receive the row of short pins *f*, called "stay-pins," which are to be embedded in the composition, but should not project through it when the brush is pressed. These stay-pins are either made of the required length, or by cutting off the points of the wires, such as are used for the brush. The holes for the wires which form the brush and for the row of stay-pins are made in the elastic rubber *h* by any proper instrument. The composition used for the back and handle is the same as employed in the manufacture of articles of this class now in use, as what is termed "hard rubber," or celluloid, or a composition of gum-shellac thickened with ground and colored earthy substances.

The method of manufacturing this brush is as follows: The elastic rubber sheet *h* having been cut the proper shape and pierced, it is placed on top of the perforated block *D*, and all the wires which are to form the brush are inserted down to the head in the rubber and in the holes of the block. The row of stay-pins is also inserted in the elastic rubber near its edge, leaving a sufficient space between the mass of wires forming the brush and the row of stay-pins for the wire ring *e* to rest in against the stay-pins. The small piece of straw-board *i*, cut of the proper size and shape to cover the heads of the wires *g* and not extend over the heads of the stay-pins, is then placed over the head of said wires *g*, to prevent the composition from being pressed around the head of the wires *g* forming the brush, but allowing the composition to be pressed onto and around the stay-pins. The block *D* is then slipped down on the wires nearly to their points, as shown in Fig. 3, ready to be inserted into and between the dies *A B C*. These dies are first heated, but not so hot as to injure the rubber *h*. The die *B* is placed over the bottom piece, *A*, the wire ring *e* is placed in the groove *b* of the die *B*, and the block *D*, carrying the prepared parts *f g h i* of the brush, is inserted, as shown in Fig. 1, in the central opening formed for that pur-

pose in the die *B*. The parts *f g h i* are then pressed down until the stay-pins *f* overlap the wire ring *e*, the wires *g* entering the holes *a* in the bottom piece, and the elastic rubber *h* rests upon the internal projecting rim, *b'*, of the die *B*. A small quantity of the composition *c* is then placed in the cavity *B'* of the middle piece and over the straw-board *i* and stay-pins. Two small wires, *m*, are then placed upon the composition in the die, to be embedded therein, and extending from the handle into the back of the brush, to strengthen the handle of the brush. Then a sufficient quantity of composition is placed in the die to fill it and form the back, rim, and handle of the brush. The heated top die, *C*, is then placed in position above the composition, and the whole placed, while hot, under a power-press and subjected to a pressure of from five to ten tons. After the die is cooled it is taken apart and the brush removed. It will then be found that about one-third of the surface of the ring *e* is exposed on the interior of the rim of the brush, giving it a very tasty appearance, as it can be of any desired form in cross-section, and plated with nickel, silver, or gold, milled or engraved, at the same time strengthening the brush at that point and forming, with the stay-pins, a very durable connection between the elastic rubber backing and the rigid back.

If desired, the metal ring *e* could, by the same method, be entirely inclosed by the composition back by making it fit loosely over the internal rim, *b'*, of the die *B*. The composition would then extend completely over it; but I much prefer the first mode.

Having now fully described my invention, I claim—

1. A wire brush in which the projecting edge or rim of the rubber sheet for holding wires, the metallic ring supporting the sheet in place, and the stay-pins retaining the sheet upon the ring are embedded in the composition back, substantially as herein described.

2. The combination of a perforated bottom piece, *A*, die *B*, grooved for the reception of a wire ring and stay-pins, and provided with an internal rim, *b'*, with a perforated block, *D*, and upper die, substantially as and for the purpose described.

3. In a wire brush, the combination of flat-headed wires, an elastic rubber backing, with short stay-pins passing through and adjoining the edge of said elastic backing and embedded in a composition back, substantially as and for the purpose described.

ALANSON C. ESTABROOK.

Witnesses:

FRANK N. LOOK,  
D. W. BOND.