(No Model.)

M. McMULLIN.

ELECTRIC BRUSH.

No. 305,321. Patented Sept. 16, 1884.

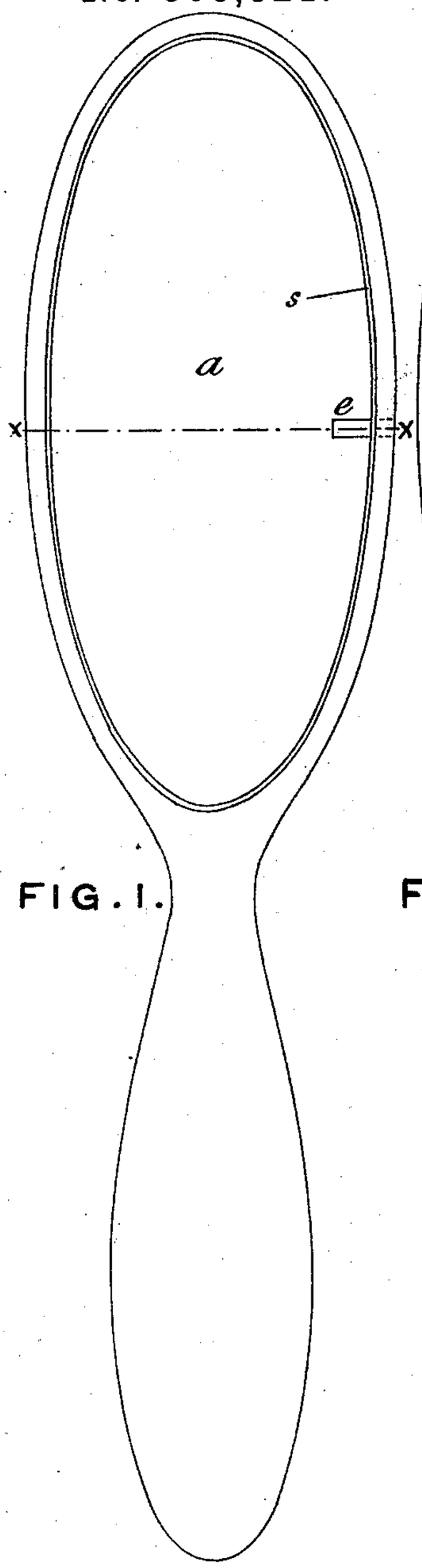

FIG. 1.

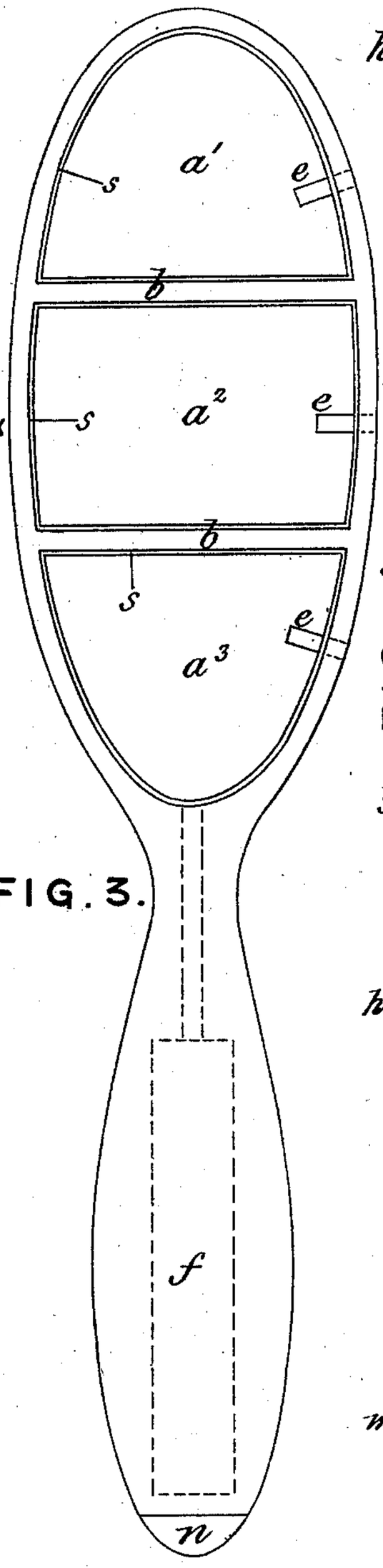

FIG. 3.

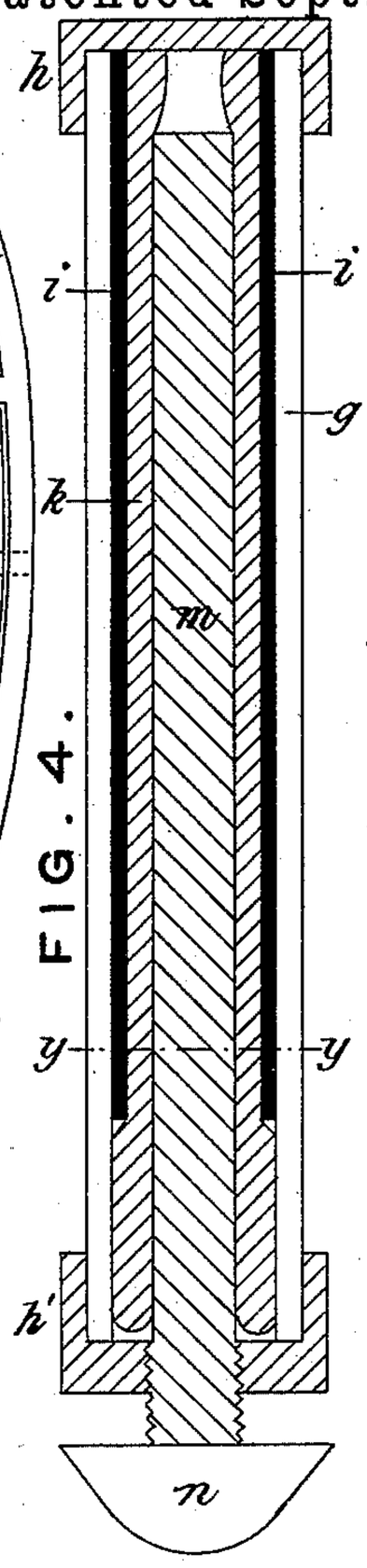

FIG. 4.

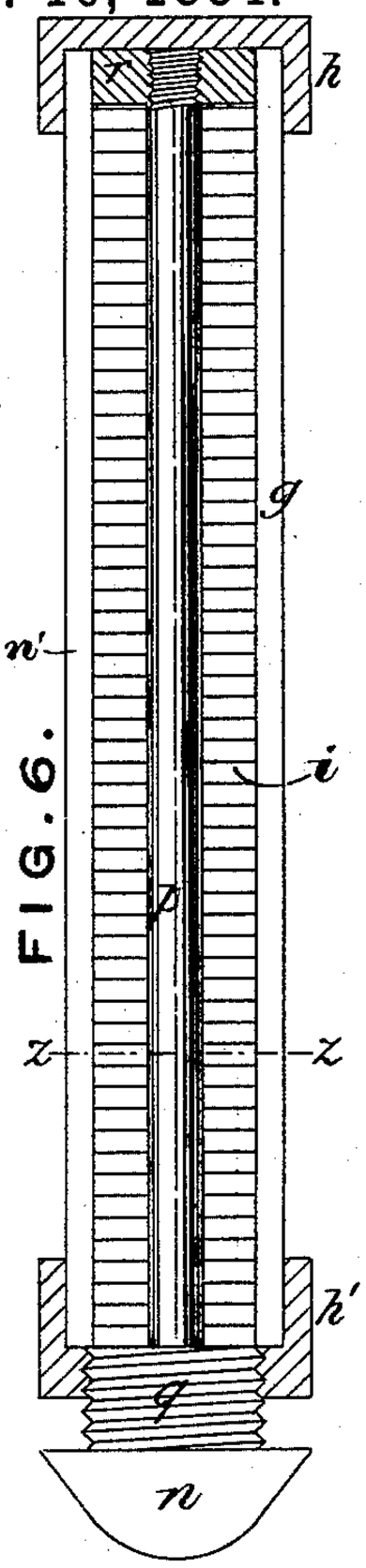

FIG. 6.

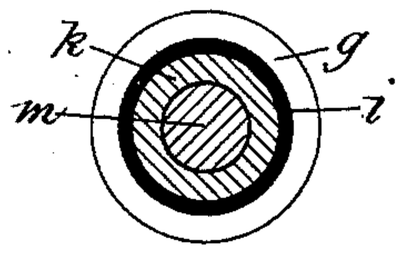

FIG. 5.

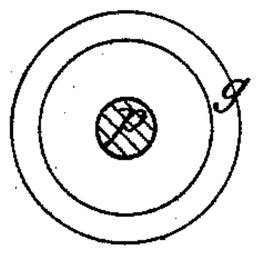

FIG. 7.

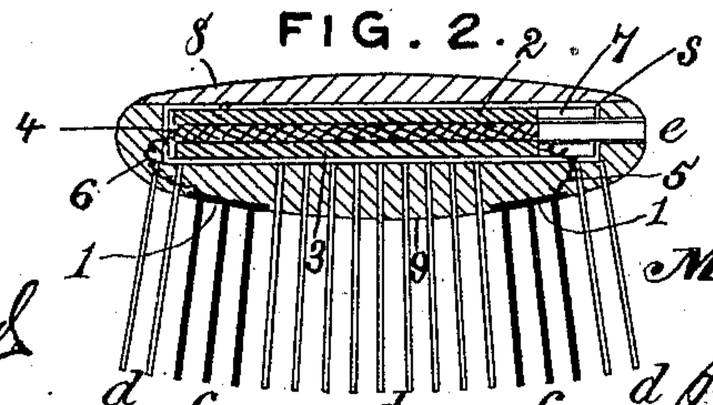

FIG. 2.

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UNITED STATES PATENT OFFICE.

MARY McMULLIN, OF 127 STRAND, COUNTY OF MIDDLESEX, ENGLAND.

ELECTRIC BRUSH.

SPECIFICATION forming part of Letters Patent No. 305,321, dated September 16, 1884.

Application filed June 12, 1883. (No model.) Patented in England February 1, 1883, No. 549.

To all whom it may concern:

Be it known that I, MARY MCMULLIN, a subject of the Queen of Great Britain, residing at 127 Strand, in the county of Middlesex, England, manufacturer, have invented certain new and useful Improvements in the Construction of Electric Brushes and in the Composition of the Exciting-Liquids, (for which I have obtained a patent in Great Britain, No. 549, bearing date February 1, 1883,) of which the following is a specification.

It has long been largely believed that the use of electric currents, locally applied, are exceedingly useful in the cure or the alleviation of many complaints, especially those of a nervous type; and also that their local application to the cuticle excites a healthy and salutary action thereof. In view of these facts many attempts have been made to furnish means by which any one, without any technical knowledge as to the construction or use of batteries for generating such currents, might be enabled to use such currents; and a compact arrangement of a battery requiring little or no attention, durable and reliable, and means of local application of the currents generated by it, so that it might be readily used by any one desiring it, has been a desideratum.

To accomplish this result is the object of my invention. In reducing it to practice, I inclose the battery entirely within the body or stock of the brush. In one instance the back of the body is hollowed out to form a chamber, which is lined with an insulating and water-proofing material, forming the receptacle for the elements composing the battery. Within it are arranged a set of any of the well-known positive and negative elements in plate form, separated by a layer of porous or textile material adapted to absorb the exciting-fluid. Over this battery-receptacle is secured a cap, ornamented as desired, so that the body or stock of the brush presents the usual appearance of an ordinary brush, while the battery is so secured and protected therein as to be safe from and guarded against disarrangement. In the side of the receptacle an aperture is formed for the introduction of the exciting-fluid, and at a point where it is readily absorbed by the fibrous material between the battery-plates. In this aperture is fitted or formed a tube extending a short distance within the receptacle, so that between its inner end and the wall of the receptacle, a trap is formed, preventing the escape of the liquid in case somewhat more that necessary to soak the fibrous material, were introduced. At the same time this aperture or tube permits the ingress of the air to the interior necessary to prevent polarization, &c. Instead of one battery being formed in the back of the body or stock of the brush, several batteries or sections of batteries might be formed therein, separated from each other, but each provided with its own apertures or tube, and as many as desired used, it being simply necessary to pour the exciting-fluid into such batteries or sections as it was desired to use, the amount of current desired being thus readily regulated. The brush proper is composed of ordinary bristles and metallic bristles, there being two or more sets of the latter, each set having as many rows as desired. The rows and individual bristles of each set are electrically connected together by wires or a plate contacting with them all; but the sets are insulated from each other, so as to form electrically two distinct sets, one of which is connected to one element of the battery while the other is connected to the other element of the battery, the two sets of metallic bristles forming then the battery-terminals, between which the circuit is closed over and through the cuticle when the brush is applied thereto. In another instance, instead of utilizing the back of the body or stock of the brush to contain the battery, I propose to utilize the handle thereof. In this case the handle is made hollow and lined with an insulating and water-proof material. In one form thereof the elements composing the battery are concentrically arranged therein. Next to the lining is placed a carbon, platinum, or other well-known negative element rolled or formed therein concentrically to the exterior receptacle. Next to it is placed the fibrous or textile absorbent material, within which is to slide the positive element—say a rod of zinc, the outer end of which is screw-threaded to fit into a screw-thread in the end of the receptacle, so that it may be secured therein. To the outer end of the zinc rod is attached a head of a configuration to correspond with that of the handle, to afford means for unscrewing and withdrawing the

zinc element, to permit its being dipped into the exciting-liquid, or to permit exciting-liquid to be poured within the receptacle. In another form the same insulating and water-proof lining for the cavity in the handle is used; but instead of a zinc rod a non-conducting-rod is used, upon which are mounted alternately negative disks, fibrous or absorbent disks, and positive disks, in which instance, on the rod being unscrewed and withdrawn from the receptacle, these disks forming the battery are withdrawn with it, and the entire organization may be dipped in the exciting-liquid and then replaced. The construction thus generally described may be better understood by reference to the drawings, in which—

Figures 1 and 3 are plan views of the body or stock of a brush embodying my invention; Fig. 2, a cross-section thereof; Figs. 4 and 6, longitudinal sections of batteries concealed in the handle of a stock or body, while Figs. 5 and 7 are cross-sections thereof, respectively.

Referring now to Figs. 1, 2, and 3, 9 represents the back of the stock or body of a brush hollowed out into one chamber, *a*, or into two or more chambers, a' a^2 a^3. Upon the walls of this chamber is to be secured the back cap, 8, so that a tight and entirely inclosed chamber, *a*, or chambers a' a^2 a^3 are formed. The chamber or chambers are lined with an insulating and water-proof material, *s*, such as ebonite, glass, &c. When the material of the stock possesses these qualities, this lining may be such material itself. Within this chamber are secured the elements 2 3, in plate form, of a battery, a fibrous or textile absorbent material, 4, being interposed. In the side of each chamber an aperture and tube, *e*, are formed and placed, by which the exciting-fluid for the battery may be introduced to the material 4, and by it placed in operative relation to the elements 2 3. The inner end of *e* extends a little distance within the chamber, so that between its inner end and the inner walls of the chamber a space, 7, (shown in dotted lines) is formed, which acts as a receptacle for any surplus fluid and forms a trap preventing its escape through *e*. Upon the face of the brush are arranged the ordinary hair bristles, *d d*, interspersed among which are two or more sets of metallic bristles, *c c'*, each set consisting of one or more rows, all the individual metallic bristles and the rows of one set being electrically connected together by a wire or metal strip, as indicated by 1. One of these sets, say c', is connected by a wire, 5, to the element 3, while the other set, *c*, is connected by a wire, 6, to the element 4. These wires pass through the walls of the chamber and are secured therein. It will be seen that these sets *c c'* of metallic bristles form the terminals then of the battery inclosed in *a*, and that the circuit between the sets is closed and a current sent upon or through the cuticle whenever the brush is applied to the same.

In Fig. 3 several chambers are shown, in each of which is to be placed a battery of similar construction, all the positive elements being connected to one set of metallic bristles, while all the negative elements are connected to the other set. Each chamber has its own tube-inlet *e* for the exciting-fluid, and more or less of the battery may then be used as desired.

In Figs. 4 and 6 are shown methods of utilizing the handle of the stock or body of a brush for the concealment and protection of the battery.

In both figures, within the handle is secured a tube, *g*, of insulating and water-proof material closed at its ends by caps *h h'* secured thereto, the latter having a screw-threaded aperture, for a purpose hereinafter set forth.

In Fig. 4 the negative element *i*, (shown in black, for clearness,) is placed within and against *g*. Next and concentric therewith is the absorbent material *k*, while the positive element is made as a rod, *m*, which passes into the space left by the absorbent material *k*, but does not extend quite to the inner cap, *h'*. To the outer end of this rod is secured the knob *n*, of a configuration corresponding to that of the handle, so as to form a part or end thereof when the parts are in position, as shown in Fig. 3. Upon this positive element, and next to end or knob *n*, a screw-thread is formed adapted to engage with the screw-thread in the aperture in *h'*. The battery thus constructed, which may be of any desired contour in cross-section, is placed in the handle, and from the cap *h*, in contact with the negative element, and the cap *h'* in contact with the positive element, conducting-wires lead to the sets of metallic bristles, as indicated in the dotted lines in Fig. 3. In order to charge the battery, the end *n* is turned until the screw-thread upon *m* is disengaged from the screw-thread in *h'*, when *m* is withdrawn, and may be dipped in the exciting-fluid, or some thereof may be poured into the chamber, when *m* is replaced, and the battery is ready for action.

In Fig. 6 the battery is the regular voltaic pile, consisting of alternating disks—positive *p*, negative *n'*, and interposed absorbent *i*—all secured to a non-conducting rod, *p*, provided with an end, *n*, and screw-thread for the same purposes as in the other form. When it is desired to use the battery, the rod *p* is withdrawn with all its attached elements, and they are dipped into the exciting-fluid and then replaced, connections being made, as in the other case, from the caps *h h'* to the sets of metallic bristles.

For an exciting-fluid, in order to escape the corrosive action of mineral acids, I prefer to use vegetable acids, finding that a fluid having acetic acid as its exciting base is preferable. The local action and circuit across or through the cuticle is aided by moistening the parts or dipping the metallic bristles in a comparatively weak acid solution, having acetic acid as its acid base. By these constructions a brush by which currents may readily be locally applied to any desired portion of a body

is furnished. Its use and manipulation require no technical knowledge on the part of the user. The battery is entirely concealed and protected within the body or stock of the brush, and the circuit is automatically closed between the metallic bristles and over or through the part they are applied to immediately upon application.

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

1. The combination, in a brush, of a battery entirely concealed and protected within its stock or body, two or more sets of metallic bristles upon its face, and uninterrupted connections from the elements of the battery to such sets of bristles, whereby a circuit is automatically formed upon or through the cuticle between the sets of metallic bristles upon their application, substantially as described.

2. The combination, in a brush, of a battery entirely concealed and protected within the body or stock thereof, sets of metallic bristles connected to the elements thereof, and a tube or tubes leading into the battery-chamber for the introduction therein of the exciting-fluid, and projecting therein a sufficient distance to form a trap preventing the escape of surplus fluid, substantially as described.

3. The combination, in a brush, of a hollow body or stock, a battery concealed and protected therein, two or more sets of metallic bristles connected to the elements of such battery, and means, substantially as described, for permitting the introduction of an exciting-fluid, but not permitting the escape of surplus fluid, substantially as specified.

In testimony whereof I have hereunto set my hand this 18th day of May, 1883.

MARY McMULLIN.

Witnesses:

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London, Patent Agent.

O. G. BEARD,
Clerk to Mr. Downing.