

(No Model.)

H. H. CHERRY & S. D. YOUNGLOVE.
VENTILATED BRUSH FOR DYNAMOS.

No. 480,762.

Patented Aug. 16, 1892.

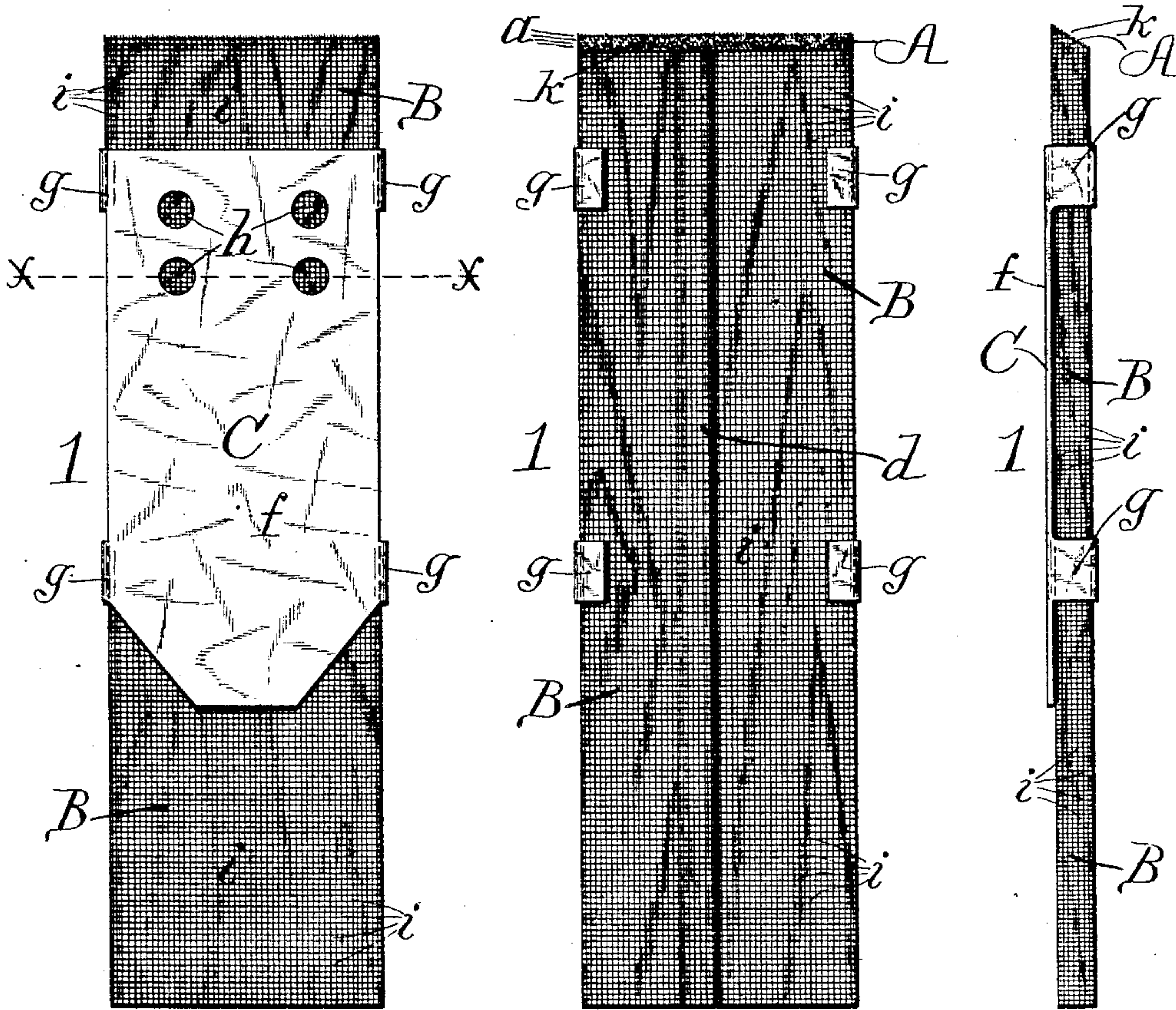


FIG-1-

FIG-2-

FIG-3-

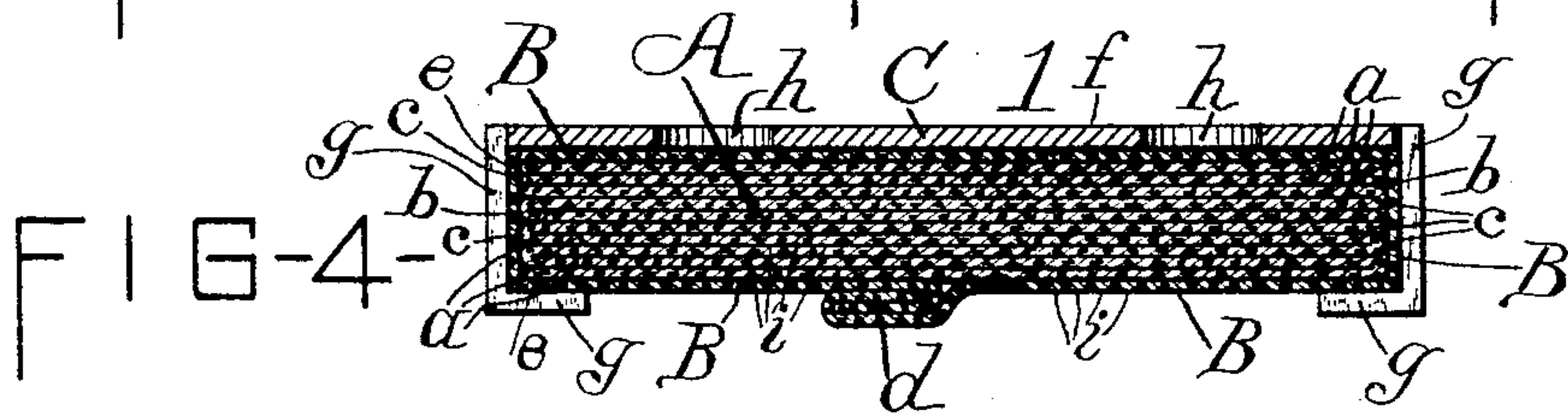


FIG-4-

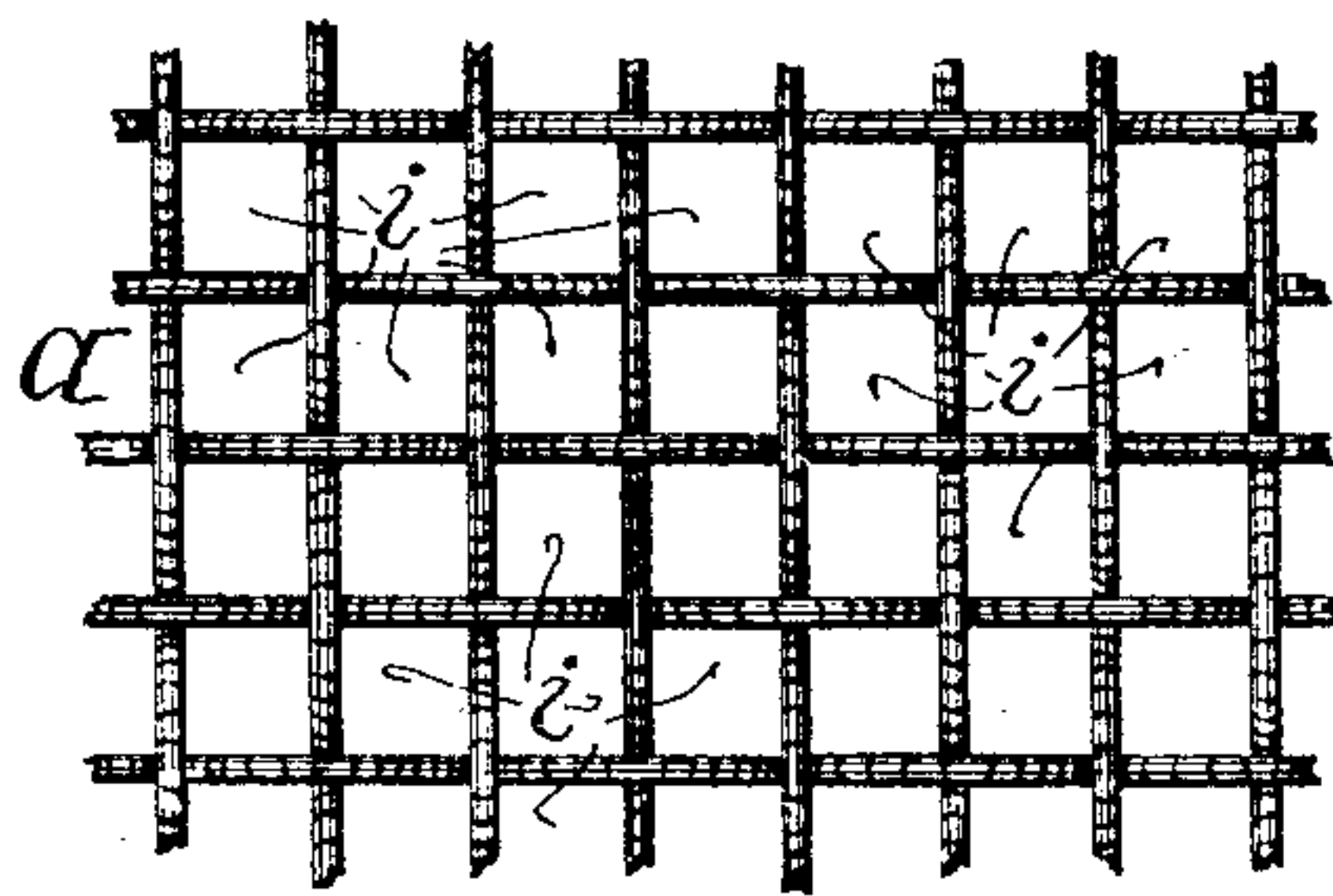


FIG-5-

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UNITED STATES PATENT OFFICE.

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VENTILATED BRUSH FOR DYNAMOS.

SPECIFICATION forming part of Letters Patent No. 480,762, dated August 16, 1892.

Application filed October 2, 1891. Serial No. 407,575. (No model.)

To all whom it may concern:

Be it known that we, HOWARD H. CHERRY and SEWARD D. YOUNGLOVE, citizens of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have jointly invented certain new and useful Improvements in Ventilated Brushes for Dynamos; and we 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, in which—

Figure 1 is a top plan view of our ventilated brush for dynamos; Fig. 2, a bottom view of same; Fig. 3, an edge view thereof; Fig. 4, a transverse section, enlarged, taken upon dotted line $x x$; and Fig. 5, a detail, greatly enlarged or exaggerated, of a fragment of the woven-wire fabric entering into the formation of our device.

Like letters of reference indicate similar parts throughout the several views of the drawings.

Our invention relates specifically to that class of devices designated as "dynamo-brushes," and which brush, inserted into a suitable brush-holder (usually spring-actuated) connected with the dynamo-frame or other satisfactory portion thereof, serves to hold an extremity of the brush in yielding contact or pressure against the revolving commutator of the armature of the dynamos, and whereby the electric current is received by and transmitted through the brush to a copper or brass binding-screw or other adaptable clamping device, securing the brush in place within the holder through said set-screw to and along the wires connecting therewith in the ordinarily-employed manner.

The object of our invention is to provide a brush adapted for the purpose mentioned of such novel construction as to insure its sufficient ventilation, elasticity, and yet rigidity, ready adaptability to longitudinal adjustment, simplicity of construction, comparatively cheap to manufacture, and comprising within itself the complete embodiment of all the features essential to the formation of a durable, practical, efficient, simple, readily-op-

erated, and practically inexpensive dynamo-brush.

Our invention consists in the novel features of construction, combination, and action of parts hereinafter described, and specifically designated in the claims hereto annexed.

b designates our ventilated brush for dynamos complete, said brush in contour, length, width, and thickness ordinarily being of the shape and of about the relative proportions, as shown, although obviously the said proportions may be varied to any desired degree.

A is the core or internal portion of the brush, extending longitudinally from end to end thereof and consisting of a sheet of woven-wire fabric, of brass or copper or analogous electric conducting metal, comprising the folds or connected layers a , extending from edge to edge and terminating edgewise lineally, as indicated at b , said folds or layers being created by the continued folding back and forth of the fabric, as denoted by the letters c . By reason of the return or reverse folds a the forming of practically straight and flat edges is insured, which would be an impossibility were the fabric to be wound round and round continuously.

The folds or layers a , comprising the core of the brush, are retained bindingly in place and pressing one against the other by means of the wrapper or binder B , comprising a sheet of woven-wire fabric of suitable dimensions passing transversely around the core A , tightly enveloping same from end to end, the longitudinal edges of said wrapper being so bent or turned as to form a secure lap-joint d and insuring a tightly-encompassing and non-separable wrapper or envelope, and as the raw edge or edges e at the start and ending of the folded-fabric core engage with and enter into the interstices of adjacent and contacting portions of the wrapper B any slipping of the wrapper longitudinally from off the core portion is effectually prevented in the improbable event of there being any chance of the tightly-drawn wrapper longitudinally slipping upon the inclosed core portion.

Although in practice the lap-joint portion

d of the wrapper B lies so closely to the body portion of the brush as to be scarcely noticeable (see Fig. 2) and actually projecting out from the body but slightly, if to any appreciable degree, when the brush is clampingly held by a brush-holder and the protuberance thus pressed in against the face of the yielding core, yet in Fig. 4 (enlarged transverse section) the lap-joint d seemingly projects somewhat prominently from the body, through the fact that in said Fig. 4 it is somewhat magnified or distorted in order to more clearly indicate the formation thereof.

C is a clasp movably fitted to the wire-fabric body of the brush—i. e., the core and wrapper combined—and consisting of a flat plate f , of copper, brass, or other satisfactory conducting substance, in form somewhat elongated and usually of a length a third or a half less than that of the brush-body and provided at its longitudinal edges with one or more hook-shaped projections which, extending loosely around the edges of the brush-body and terminating upon the opposite side a brief distance from the adjacent edge of the body, form, in connection with the overhead flat plate portion f , guideways g , as indicated, and h denotes ventilating-holes formed in the top or forward portion of the plate portion f^2 of the clasp C of our brush. This clasp, comprising the flat plate portion f and the lateral hooks g , we preferably form of an integral blank formed to proper shape.

Preferably in the woven-wire fabric utilized by us in the formation of the core and practically integral wrapper of the brush-body of our device the woof and weft of wire are so disposed that the meshes or interstices created thereby form square ventilating-openings i of uniform size, the diameter of each ventilating-opening created by the woof and weft of small-sized woven wire being of like diameter, both lengthwise and crosswise the brush-body, as quite clearly shown in Figs. 1, 2, and 3 of the drawings, and particularly brought out in the greatly-enlarged detail, Fig. 5. The provision of uniform and equal-sized ventilating-openings or air-holes throughout both the core and the wrapper of woven-wire fabric comprising the brush-body proper insures proper and adequate ventilating thereof when the brush is in its holder and an end bearing against the revolving commutator of the armature of a dynamo, and thus serving to retain the brush-body virtually cool, even under the most severe usage, and whereby undue or excessive heat or friction tending to injurious effects to the commutator and armature of the dynamo whereto the brush is applied is entirely obviated.

At the commutator-contact extremity of our brush-body the same is suitably beveled or concaved, as designated by the letter K, to accord with the contour of the periphery of the commutator, against which the brush-body presses when revolving.

In the event of one or more of the wire ends or portions of the contact extremity K of the brush-body becoming bent or lying to one side in such manner as to strike against a segment of the commutator adjacent to that segment thereof against which the commutator-contacting end of the said brush-body is for an infinitesimal period in contact with during the rapid revolution of the ordinarily and segmentally formed commutator, the unduly and wayward projecting bent wire is so ductile and of such small diameter as to be instantaneously consumed, and thus improper contact of a stay-wire end or ends with an adjacent segment of the commutator rendered possible for but a fraction of a second, and thus absolutely and completely obviating any burning of or other injury to the revolving cylindrical commutator of the armature, as is so frequently the case with the ordinarily-employed forms of brushes for dynamos.

The purpose of the clasp C is to serve as a guide for the brush, in that while retaining it laterally immovable it concurrently admits of either the clasp being moved longitudinally along the brush-body, or vice versa, the brush-body longitudinally within the clasp, whereby the desired or appropriate amount of projection of the woven-wire brush-body beyond the forward edge of the clasp can readily be regulated. In practice the forward end of the body usually projecting beyond proportionally, as shown, and as the beveled extremity becomes gradually burned or destroyed the clasp C is slipped rearwardly a satisfactory distance to insure a suitable degree of projection of the brush-body beyond its forward end; also, the intent or function of the clasp is to serve the purpose of a stiffener to the contacting or encompassed portions of the wire-fabric body, and insuring thereat the essential degree of rigidity and unyieldingness, while permitting above its forward end all requisite and desirable flexibility to the abutting commutator-engaging portions of the wire body. Moreover, the purpose of the ventilating-holes at the forward portion of the aforesaid clasp is to act as auxiliary ventilators or air-holes to the woven-body portion, and thereby insuring an additional degree of coolness to the complete brush when in operative contact with a dynamo.

Obviously the cooler the brush can be kept the better and more advantageous it is, not only for the same, but particularly for the commutator, armature, and other portions of the dynamo whereto it is applied. Additionally, the metallic plate f of the clasp C forms a bearing for the reception of the pressure against the top face of the brush of the copper or brass binding screw or clamp usually working in the brush-holder of the dynamo and pressing at an end against the brush to retain it in contact with the commutator of the dynamo's armature.

It will readily be discerned that ours is a thoroughly-ventilated brush, the equally-

formed ventilating-spaces of the wire fabric being of so much greater size in proportion to the size of the woof and weft of wire entering into the construction of the fabric that the combined ventilating-spaces occupy an area greatly in excess of the wire solid parts thereof—a matter of exceeding value.

Evidently thin metallic sheets with infinitesimal perforations might be utilized in lieu of a strip or strips of woven-wire cloth or the same folded or arranged in layers somewhat differently from the precise manner we show and describe without evading the true scope or intent of our invention, such possible changes of details evidently being mere colorable variations of the salient features of our device.

It is readily apparent that by our utilization of a lap or analogous joint for retention together of the folds or layers entering into the formation of our laminated brush-body all soldering or stitching of same together is avoided, and thereby obviating such needless expense and labor and yet fully accomplishing the object sought.

In the utilization of our brush for service absolutely no oil or other lubricating compound is required on the commutator of the dynamo, it being utterly impossible for the brush to become gummed or clogged, the ventilating-spaces in the brush-body for the circulation of air preventing the lodgment or accumulation of floating dust, &c., and thereby, as demonstrated by actual tests, thoroughly obviating any gumming or stickiness of the brush or the commutator—a feature of essential value.

The value, utility, practicability, advantages, simplicity, and comparative inexpensiveness of our brush can be readily appreciated by all users of dynamos, obviating, as it does, all the defects and disadvantages incident to the employment of the common forms.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A ventilated brush for dynamos, consisting of a perforated core or interior portion, a perforated wrapper inclosing the core, and a clasp engagingly connected to the perforated brush-body and adapted to longitudinal movement therewith, substantially as described.

2. In a ventilated brush for dynamos, in combination, a perforated core or interior portion, a perforated wrapper surrounding said core, and a perforated clasp or guide attached to the core's wrapper and adapted to be moved longitudinally thereon, substantially as described.

3. The combination, in a ventilated brush for dynamos, of a perforated core or internal portion composed of folded woven-wire fabric, a perforated wrapper or jacket inclosing same, and a perforated clasp or holder partially encompassing the wrapper portion of the brush

in such manner as to adapt the movement of the clasp longitudinally with the brush-body, or vice versa, substantially as described.

4. A ventilated brush for dynamos, consisting of a perforated core or interior portion formed of folds or layers of woven-wire cloth lying contiguous one to the other, a perforated wrapper of woven-wire cloth binding the folds or layers together, and a perforated clasp or plate secured longitudinally movable upon the wrapper of the core by means of lateral guideways or hooks, all combined and operating substantially as described.

5. The combination, in a brush for dynamos, of the perforated core or interior formed of a single strip of woven-wire fabric folded back and forth to create layers of equal width, a perforated wrapper of woven-wire fabric immovably inclosing same and having its edges coupled together by a lap-joint, and a loosely-attached clasp-plate provided with perforations connected to the wrapper portion of the brush and adapted to longitudinal adjustment thereon, substantially as described, and for the purposes set forth.

6. The combination, in a ventilated brush for dynamos, of the uniformly-perforated core or central portion composed of a sheet of woven-wire cloth alternately folded back and forth and forming adjacent perforated layers of similar width, a perforated wrapper or band of woven-wire cloth inclosing the said core and of corresponding length longitudinally, the meeting side extremities of the wrapper being coupled together by a lap-joint extending longitudinally with the immovably-inclosed core portion, and a perforated clasp-plate secured to a face of the wrapper portion by lateral hook-shaped projections loosely engaging the opposite face of the wrapper and adapted to desired longitudinal adjustment upon the perforated woven-wire body of the brush, substantially as described, and for the purposes specified.

7. In a ventilated brush for dynamos, the core or central portion composed of contiguous folds of equal width formed of a single sheet of woven-wire fabric folded back and forth, square and uniform-sized ventilating-apertures throughout the said core portion created in the weaving of the wire fabric, a wrapper of woven-wire fabric snugly encompassing the perforated core and secured together at its edges by a lap-joint lying parallel with the brush's length, square and uniform-sized ventilating-openings in the wrapper created in the weaving of the fabric, and a clasp formed of a metallic blank bent to shape contiguous to an external face of the wrapper and secured longitudinally adjustable thereon by integral L-shaped guides loosely embracing the lateral edges of the wrapper immovably attached to the core, all combined and operating substantially as described, and for the purposes set forth.

8. In a ventilated brush for dynamos, in combination, the ventilated core or interior

portion composed of folds or layers of woven-wire fabric whose spaces are square and of uniform size, one or more raw edges to the combined folds or layers comprising the core
 5 portion which terminate in line with the evened longitudinal edges of the aggregated folds or layers, a ventilated wrapper or binder of woven-wire fabric having square and uniform-sized apertures inclosing said core and retaining the folds or layers thereof together
 10 and held longitudinally immovable thereon by the contact of the raw edge or edges of the core with the contiguous interstices of the wrapper, the parallel edges of the wrapper fabric being united together and firmly
 15 inclosing the core by a lap-joint connection, and a metallic clasp or shield secured longitudinally movable upon the wrapper of the core, substantially as described, and for the
 20 objects specified.

9. A ventilated brush for dynamos, comprising a ventilated core or body portion composed of perforated metallic folds or layers disposed together and a ventilated wrapper
 25 or band composed of a perforated metallic covering encircling said core and retaining the same stationary within its wrapper, substantially as described.

10. In a ventilated brush for dynamos, a
 30 perforated laminated core or body portion formed of suitable electric conducting material, a perforated wrapper or band circumferentially inclosing the said core and retaining it immovably within its wrapper, the con-

tacting ends of the wrapping-band being connected together by a lapped joint, and a perforated clasp-shield movably secured to the wrapper of the core, in combination, substantially as described, and for the purposes specified.
 40.

11. The combination, in a brush for dynamos, of the perforated laminated core having a circumferentially inclosing perforated wrapper retaining its parts in place, said core portion and its wrapper being coincidently beveled at one end, and a metallic plate or clasp provided with perforations adjustably secured to the wrapper of the core, substantially as described.
 45.

12. A ventilated brush for dynamos, made
 50 of perforated metallic layers retained together by a perforated metallic band or wrapper extending the length of the said layers, substantially as described.

13. A ventilated brush for dynamos, formed
 55 of layers of wire fabric wherein the individual wires in one direction are parallel to the axis of the commutator and the other individual wires transversely to said axis, substantially as described.
 60.

In testimony whereof we affix our signatures, in the presence of two witnesses, this 27th day of July, 1891.

HOWARD H. CHERRY. [L. S.]

SEWARD D. YOUNGLOVE. [L. S.]

Witnesses:

WM. C. RAYMOND,

HARRY E. BATES.