

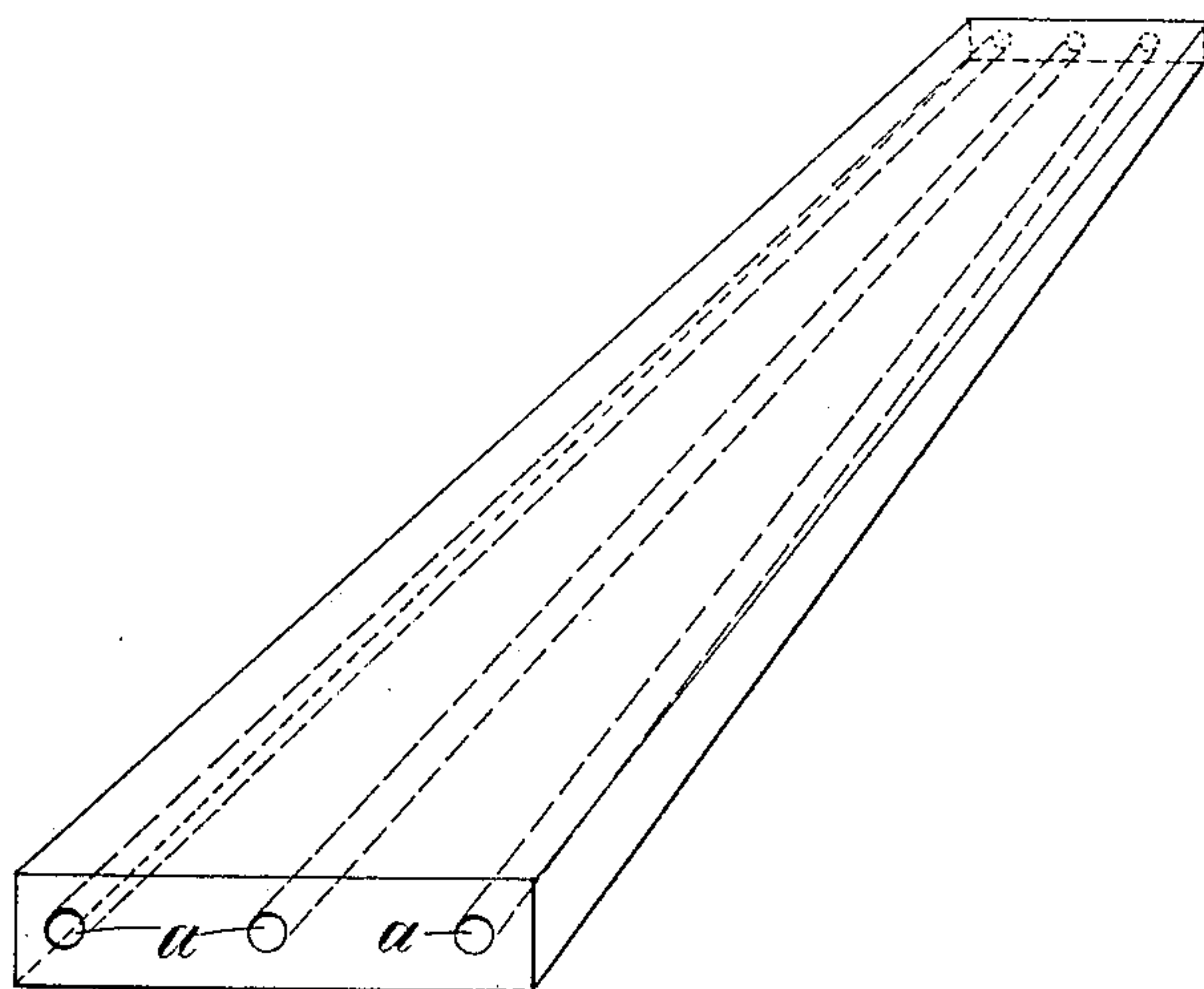
No. 752,820.

PATENTED FEB. 23, 1904.

M. BÜNNIG.  
DYNAMO BRUSH.

APPLICATION FILED OCT. 5, 1903.

NO MODEL.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

MAX BÜNNIG, OF GARDELEGEN, GERMANY.

## DYNAMO-BRUSH.

SPECIFICATION forming part of Letters Patent No. 752,820, dated February 23, 1904.

Application filed October 5, 1903. Serial No. 175,837. (No model.)

*To all whom it may concern:*

Be it known that I, MAX BÜNNIG, a subject of the King of Prussia, German Emperor and a resident of Gardelegen, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Dynamo-Brushes, of which the following is a full, clear, and exact description.

The present invention relates to the manufacture of dynamo-brushes, consisting of metallic dust in combination with a suitable binding means. Now I am well aware that the employment of the said means for the manufacture of dynamo-brushes is already known; but it is to be stated that up till now celluloid, gelatin, or albumin has been used as a binding means for the metallic dust. The employment of these binding means, however, has the disadvantage that the same when being carbonized will leave in the brush a large residuum of ashes, which is non-conducting and which will considerably reduce the homogeneity and stability of the brush. The consequence of it will be that the brushes will easily break and that the same when running on the dynamo will crumble off, whereby they will get rough and uneven contact-faces. The said disadvantages of the usual dynamo-brushes made of metallic dust will be dispensed with by the present invention.

The same consists in the employment of a special binding means for the metallic dust—namely, tar. At the heating (glowing) of the brush the tar will not become carbonized, but coked, so that in this state it will leave in the brush only a very small residuum of ashes, but about one-third of its weight partly as finely-distributed carbon and partly as coke. The said residuums have become conducting by the heating process, so that they will not injure the conductivity of the brushes. The residuum of ashes which remains in the brush at the employment of tar amounts only to about 0.04 per cent., and the action of the same will be compensated by the conducting material being conveyed into the brush in the form of the coked tar. On the other hand, the stability of the brush becomes duly in-

creased by reason of the want of residuums of ashes. Thus the breaking of the brushes will be reduced to such a degree that it may happen only in consequence of inattention, while the crumbling off of the brushes is fully dispensed with, so that a smooth and even contact-face will be permanently obtained, which leans close to the collector. Dynamo-brushes being made by means of the usual binding means for the metallic dust above stated are in possession only of at most three-fourths of the conductivity of the present brush.

The process of manufacturing the present dynamo-brush is as follows: The metallic dust is first mixed with a corresponding quantity of tar until a granular mass is obtained, which will be pressed by means of forming-machines into the brush shape, as desired. Simultaneously with the pressing of the brush longitudinal channels *a* (see the accompanying drawing) are formed within the body of the brush. This body will then be heated (glowed) until it has reached a temperature in which the tar will be coked, (not carbonized.) After the cooling of the same a mass being a little softer and consisting, advantageously, of a mixture of graphite and metallic dust will be injected into the channels *a*, whereupon the body will be heated once more a short time upon about one-third of the former temperature. Thus the brush will appear to be substantially ready.

The arrangement of the channels *a* within the brush and the stuffing of the same with a softer mass has the advantage to reduce, respectively, to soften the hard friction of the brush upon the collector, and to effect in a certain manner an automatical lubrication.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A brush for magneto-electric machines composed of metallic dust and coked tar.
2. A brush for dynamo-electric machines consisting of a body portion composed of metallic dust and coked tar having incorporated therein a softer metallic filling.
3. A process of making brushes for electrical machines consisting of mixing a quan-

tity of metallic dust and tar, pressing the mass into form and heating the same to a temperature for coking the tar.

4. A process for making brushes for electrical machines consisting of first mixing a quantity of metallic dust and tar till a granular mass is obtained, pressing the mass into form with openings therein, then heating the same to a point where the tar will be coked and al-

lowing the form to cool and finally introducing a softer metallic filling into the openings of the body.

In witness whereof I have hereunto set my hand in presence of two witnesses.

MAX BÜNNIG.

Witnesses:

WOLDEMAR HAUPT,  
HENRY HASPER.