

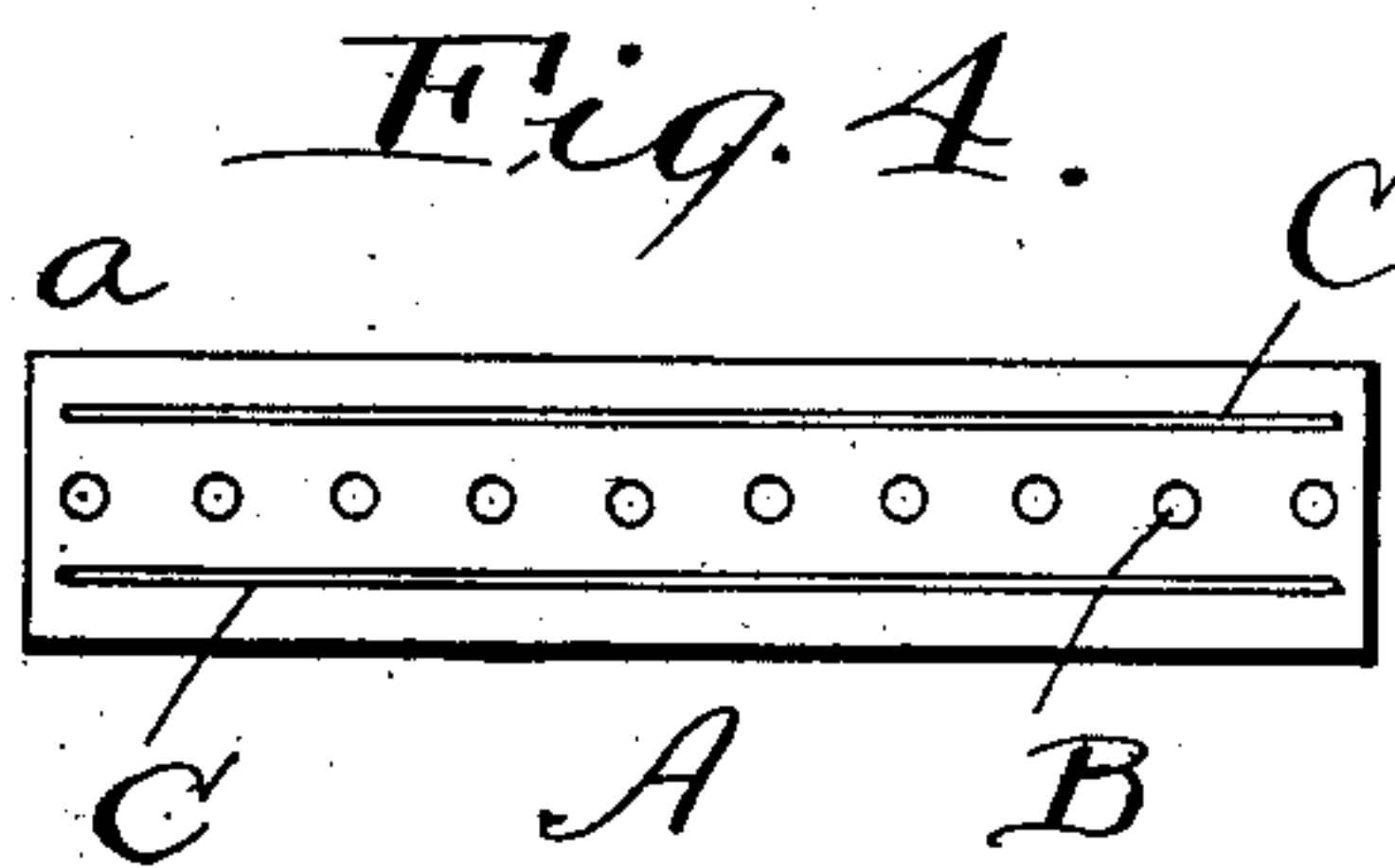
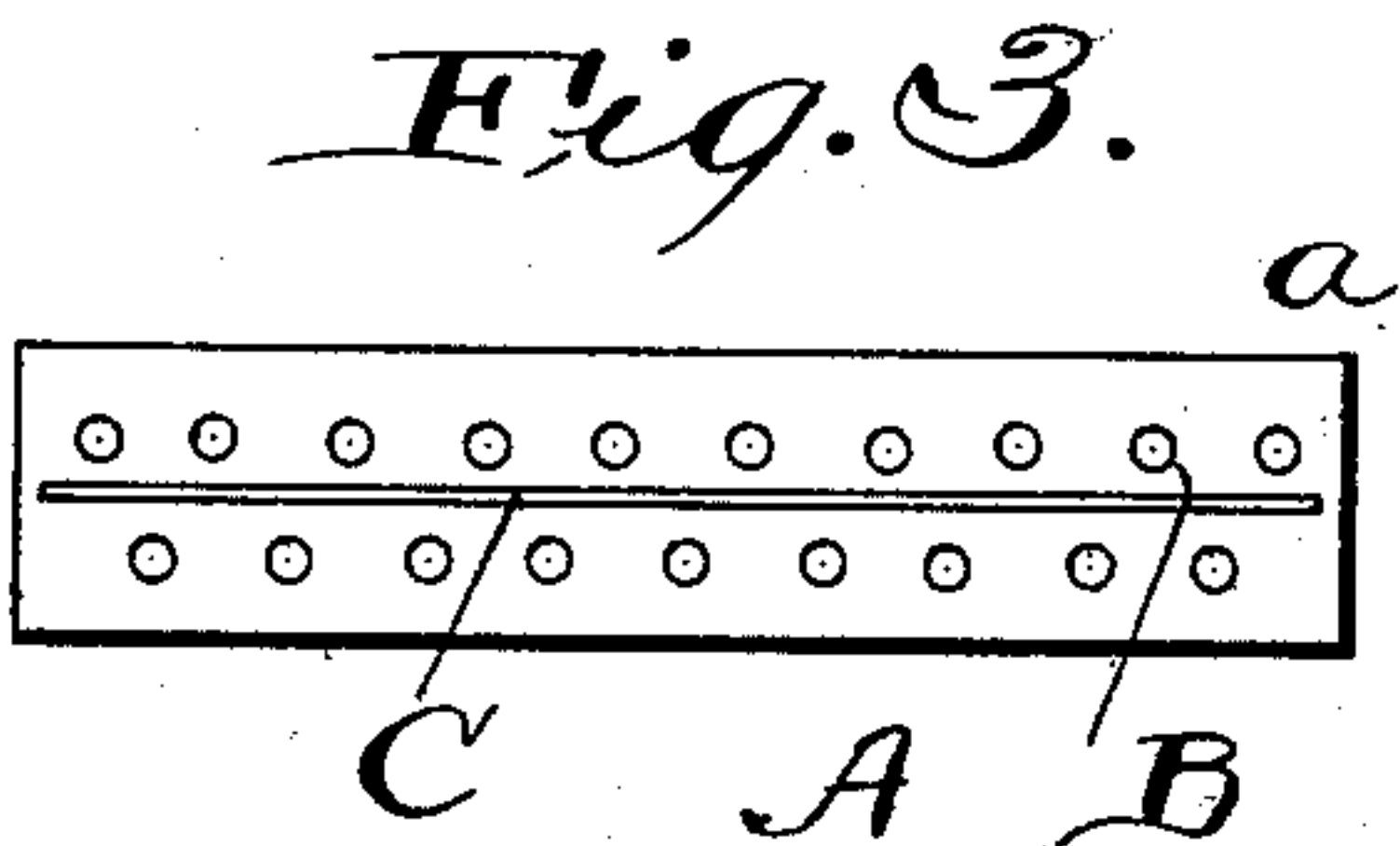
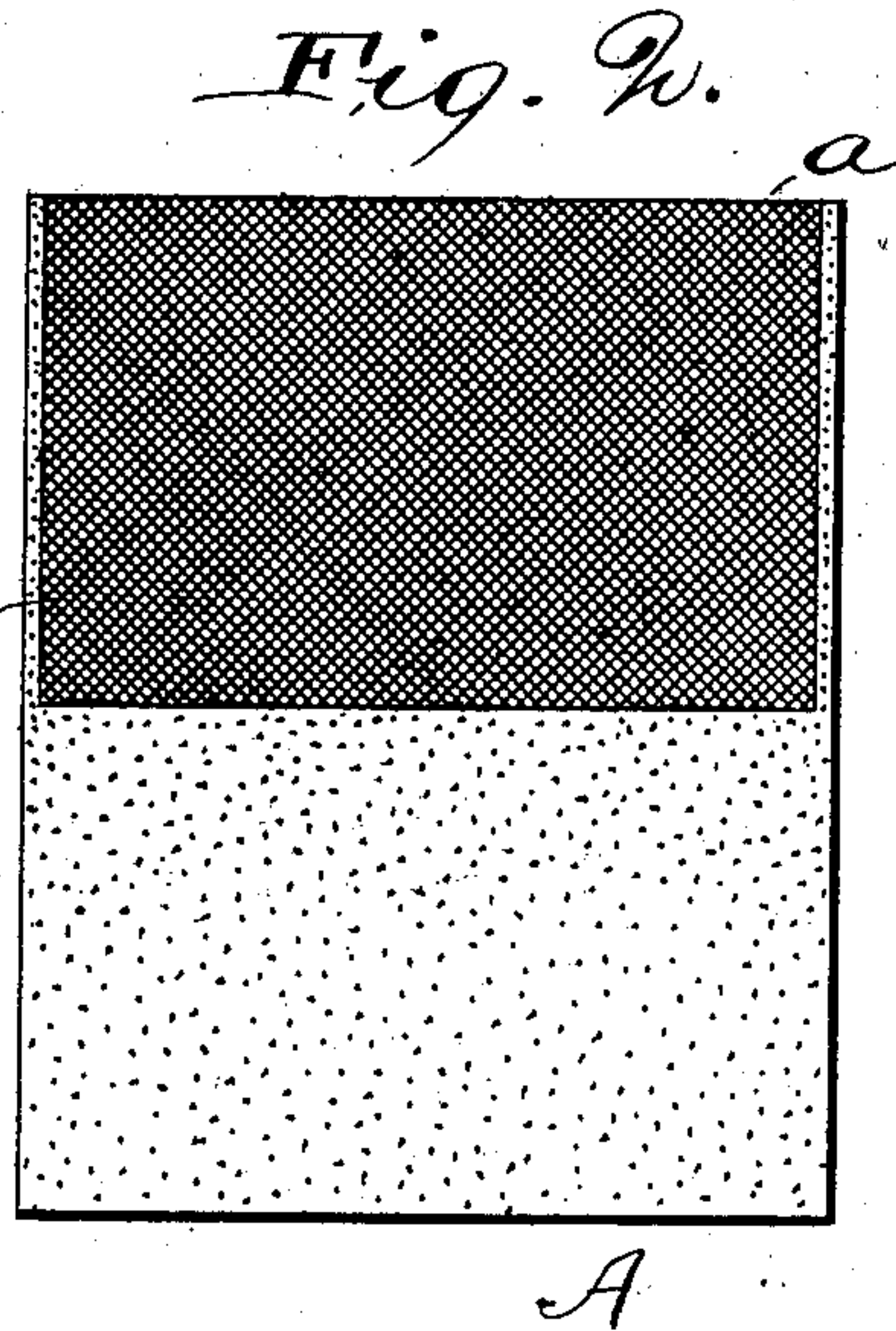
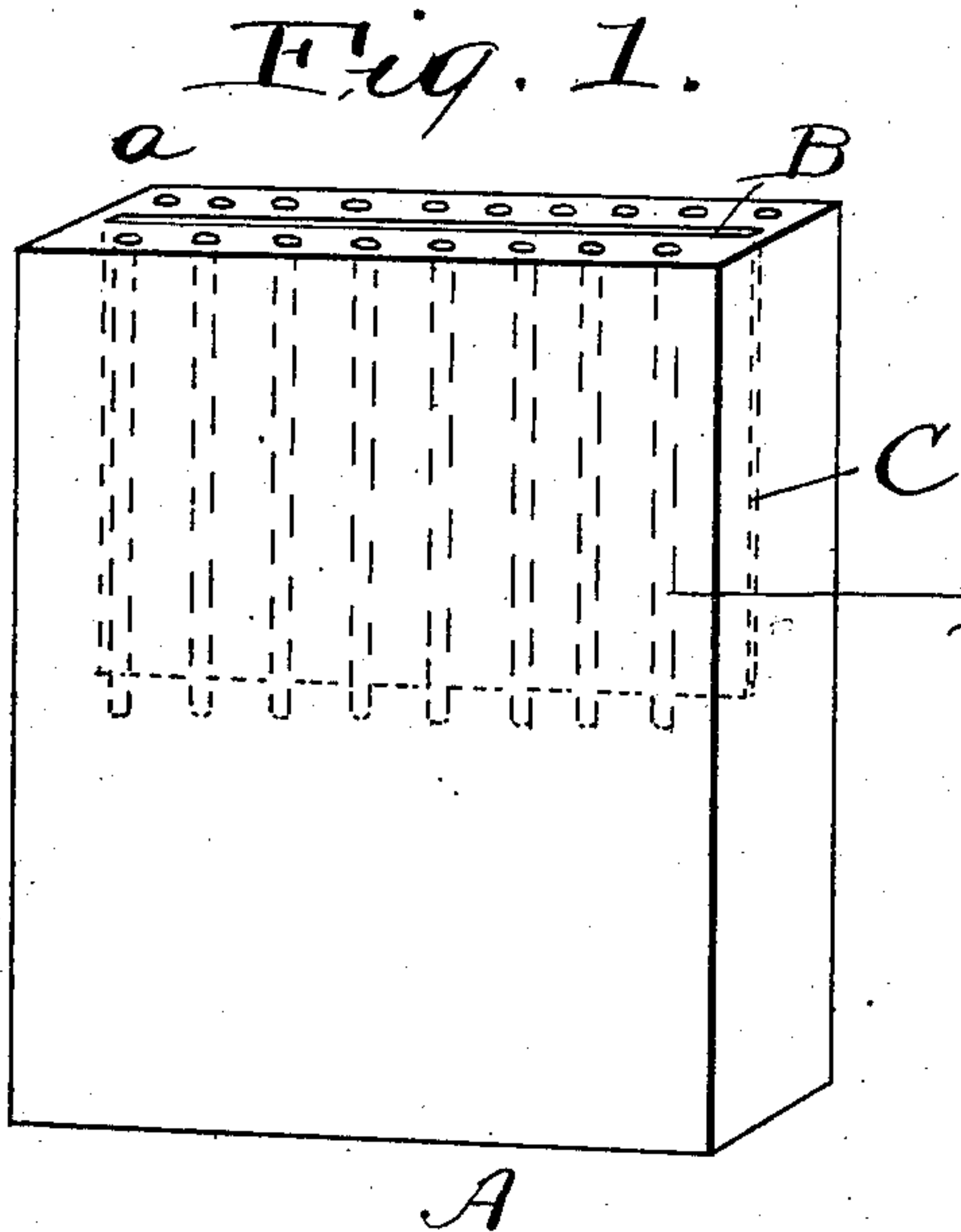
No. 736,154.

PATENTED AUG. 11, 1903.

C. T. RICHMOND.  
ELECTRIC BRUSH.

APPLICATION FILED MAY 10, 1902.

NO MODEL.



Witnesses  
E. B. Gilchrist  
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Inventor  
Charles J. Richmond,  
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# UNITED STATES PATENT OFFICE.

CHARLES T. RICHMOND, OF CLEVELAND, OHIO, ASSIGNOR TO THE NATIONAL CARBON COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF NEW JERSEY.

## ELECTRIC BRUSH.

SPECIFICATION forming part of Letters Patent No. 736,154, dated August 11, 1903.

Application filed May 10, 1902. Serial No. 106,689. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES T. RICHMOND, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Electric Brushes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to improvements in brushes for electric generators, motors, controllers, and various electrical appliances where electrical contact between relatively movable surfaces is required—as, for example, between a fixed brush and a rotating commutator.

The object of the present invention is to provide an electric brush which will lubricate the surface of the commutator, and therefore greatly reduce the wearing away of the same, which will itself wear away no more rapidly than the carbon brushes, but which will be a better conductor. The invention consists in an electric brush having the characteristics of construction hereinafter described, and definitely pointed out in the claim.

In the drawings, Figure 1 is a perspective view of the best exemplification of the invention now known. Fig. 2 is a central vertical section of the brush shown in Fig. 1. Fig. 3 is a top plan thereof, and Fig. 4 is a top plan view of a modified construction having a somewhat different arrangement of the parts.

The brushes shown in the drawings are composed for the most part of carbon, being in this respect substantially like the brushes of the old art, and they may be of any suitable shape or size. Embedded in the carbon are rods B, of plumbago or some other material which is a lubricant. These plumbago rods may be of any suitable shape. Any number of them may be employed. They are preferably arranged in rows—as, for example, in one row, as shown in Fig. 4, or in two rows, as shown in Figs. 1 and 3. They extend longitudinally from the contact end *a* of the brush. They should occupy positions about equal distances from the two outer surfaces or sides of the brush.

C represents a sheet of copper gauze which

is embedded in the carbon part of the brush and extends from the contact end thereof a suitable distance toward the other end. When two rows of the plumbago rods are employed, as shown in Figs. 1 and 3, a single sheet of copper gauze is placed, preferably, midway between the two rows. When one row of plumbago rods is employed, two sheets of copper gauze are employed, and these two sheets are placed on opposite sides of the row of plumbago rods and about midway between said rows and the sides of the brush.

The described construction is of greatest value, because the plumbago rods automatically lubricate the surface against which the brush bears, and therefore very greatly reduce the rapidity with which the surface is worn away by the brushes. Moreover, the brushes themselves do not wear away much, if any, more rapidly than if they were made wholly of carbon, because of the lubrication of the opposed surface by the plumbago rods. The conductivity of the brushes is increased both by the plumbago rods and by the sheets of copper gauze, and the greater part of the current flows through the zone of greatest conductivity in which these rods and sheets of gauze lie. This diminishes the loss of current from the surfaces, which is of course a desirable characteristic. Moreover, the current flowing through this zone is not disturbed by the Foucault or eddy currents, which in so far as they exist in the brush are confined to that part thereof which lies between the outer surfaces of the brush and the gauze sheets or rods, as the case may be.

Having described my invention, I claim—

An electric brush composed of carbon, in which is embedded copper-wire gauze, and rods of a solid lubricating material, as, for example, plumbago, which gauze and rods extend a suitable distance from the contact end of the brush toward the other end thereof.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

CHARLES T. RICHMOND.

Witnesses:

E. B. GILCHRIST,  
E. L. THURSTON.