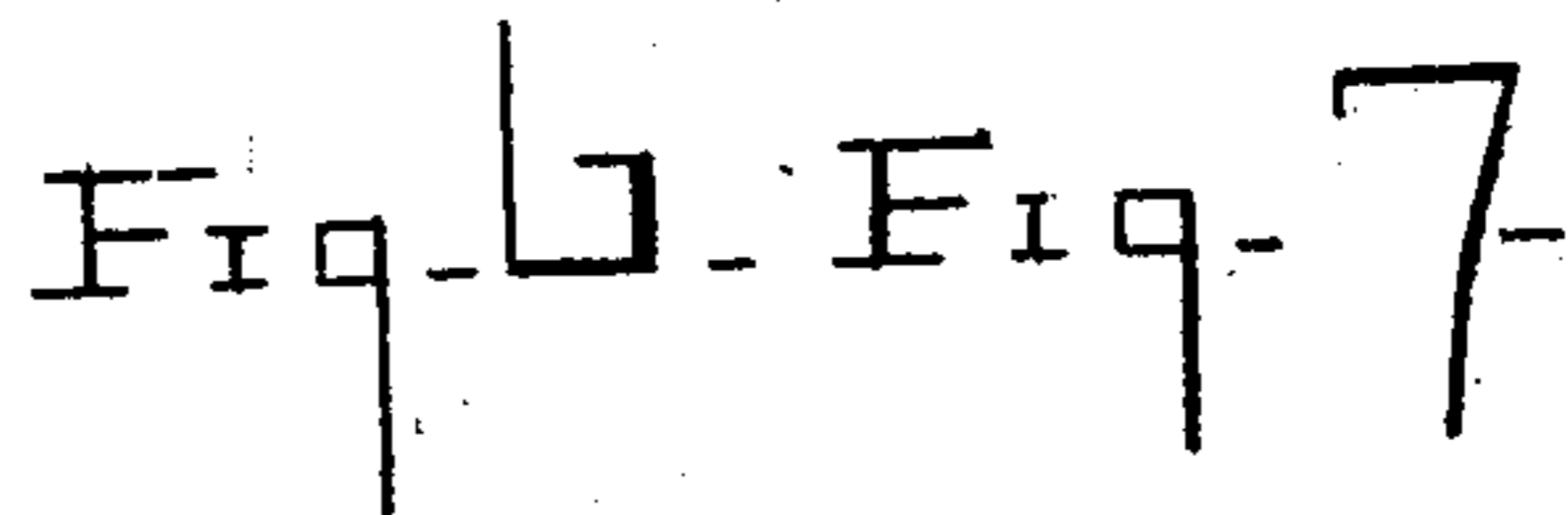
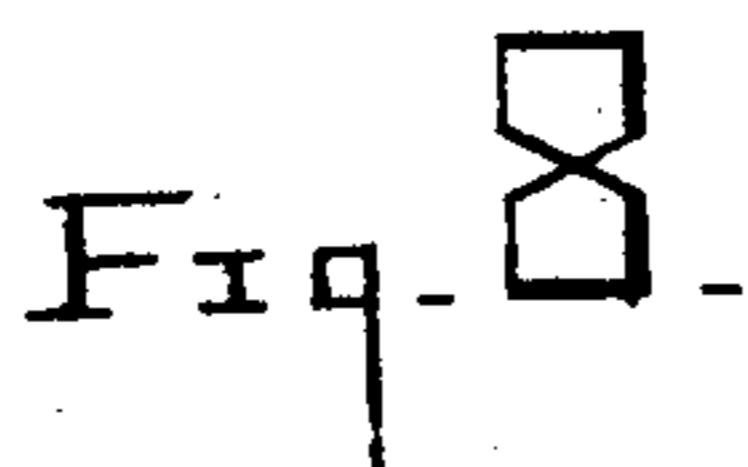
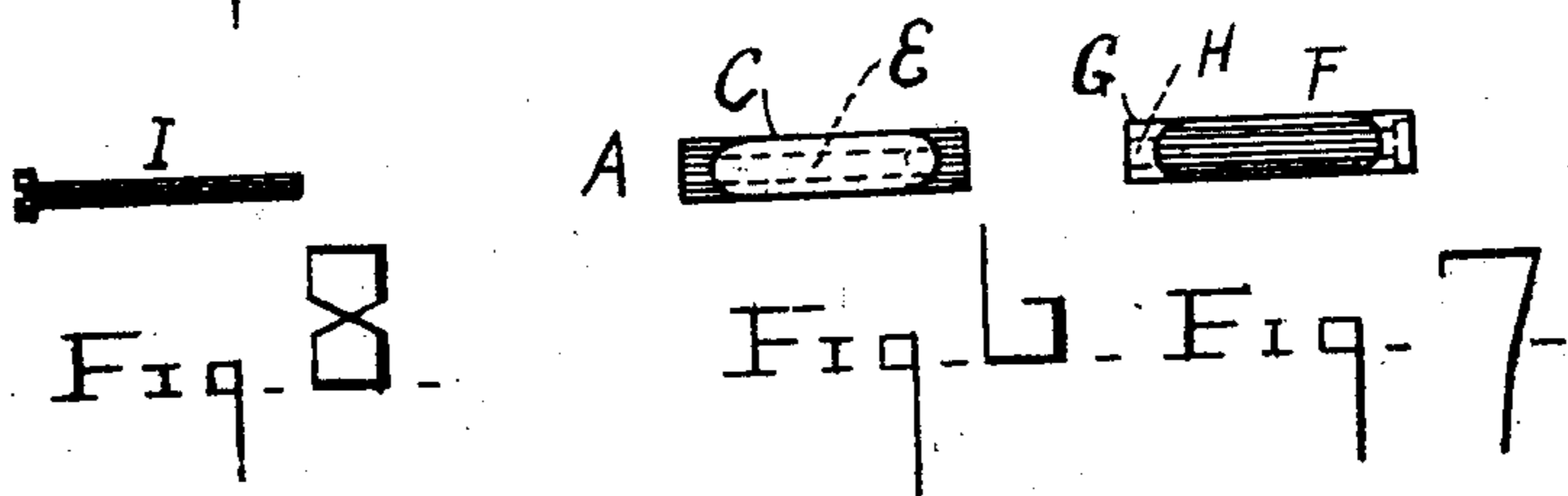
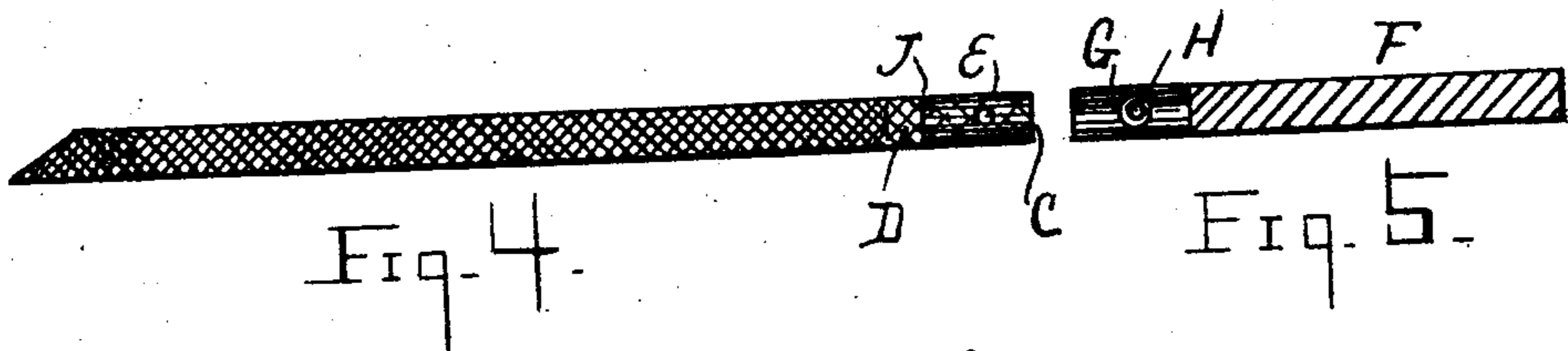
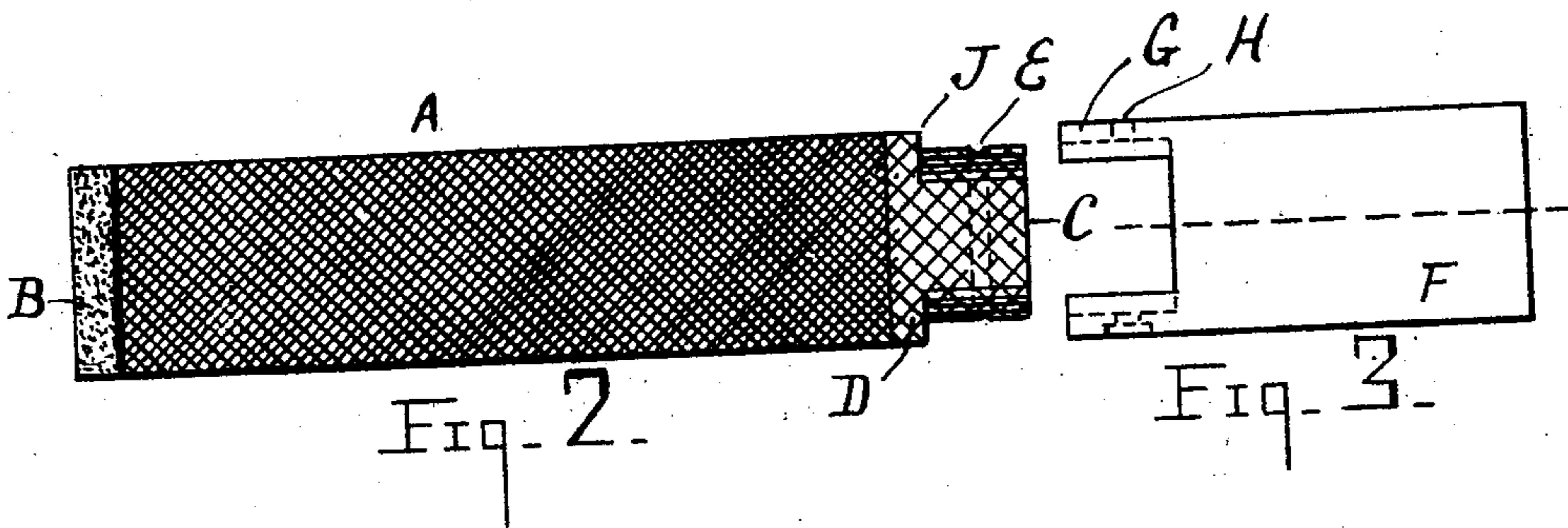
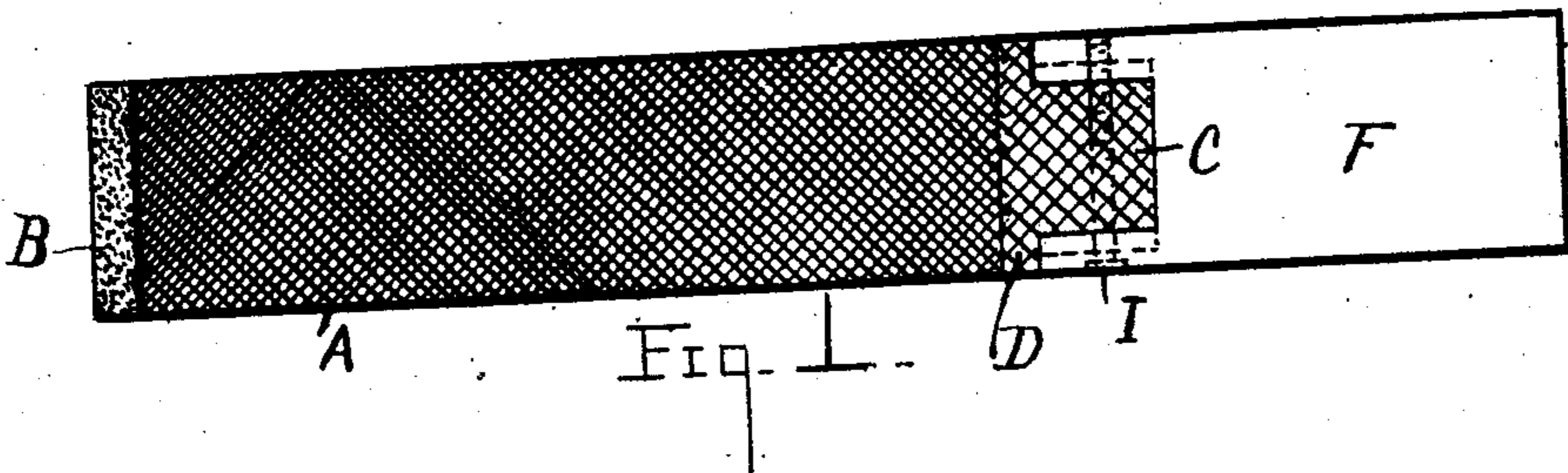


(No Model.)

A. K. WARREN.
COMMUTATOR BRUSH.

No. 571,420.

Patented Nov. 17, 1896.



Witnesses
Albert Pophma
Ruf. R. Bailey

Inventor
Aldred K. Warren,
By his Attorney
Charles M. Catlin.

UNITED STATES PATENT OFFICE.

ALDRED K. WARREN, OF NEW BRIGHTON, NEW YORK.

COMMUTATOR-BRUSH.

SPECIFICATION forming part of Letters Patent No. 571,420, dated November 17, 1896.

Application filed May 15, 1896. Serial No. 591,696. (No model.)

To all whom it may concern:

Be it known that I, ALDRED K. WARREN, a citizen of the United States, and a resident of New Brighton, county of Richmond, and State of New York, have invented certain new and useful Improvements in Commutator-Brushes, of which the following is a specification.

This invention relates to commutator-brushes for dynamos, electric motors, &c., the main object of the invention being to provide a brush adapted to utilize the whole length of the contact material or body of the brush, such as wire, woven wire, metal strips, or carbon, thereby avoiding waste which occurs in connection with brushes now in common use, owing to the fact that when the brush is but partially worn away it becomes too short for further use. In the improved brush the outer end of the contact part when of wire, carbon, or similar yielding or fragile material is made solid and formed to receive an extension-piece and securing device whereby almost the entire length of the contact-brush can be used.

In the drawings, Figure 1 is a bottom plan view of my improved brush complete. Fig. 2 is a similar view of the woven-wire or other contact part of the brush detached from the end extension. Fig. 3 shows the end extension detached. Figs. 4 and 5 are respectively edge views of the parts shown in Figs. 2 and 3. Fig. 6 is an end view of the part shown in Fig. 4, looking from the right. Fig. 7 is an end view of the part shown in Fig. 5, looking from the left; and Fig. 8 is a connecting bolt or screw.

A is a commutator-brush body, B being the end that in use bears on the commutator cylinder or surface, and C being the outer reduced end, which is adapted to be connected to an extension-piece F, which is preferably of aluminium, but which may be of other metal or suitable material. It is best to have piece F of the same width and thickness as the part A, so that when together their sides and edges shall lie in common planes. The part F is preferably formed with two projecting arms G, grooved on the inner sides and

adapted to embrace and snugly fit onto the end C.

H are holes in arms G, which, when parts A and F are together, register with hole E in the solid end C.

I is a bolt, screw, or pin adapted to be inserted in said holes and forming a means for securing parts A and F together.

When part A is subdivided or is of yielding or of fragile material, the end C of the brush for a considerable distance, say an inch or inch and a half, is solidified in a suitable manner, as by dipping said end into molten metal in such manner that it shall permeate the interstices of said end, making it firm and strong, as well as binding the separate layers or subdivisions together, similarly to soldering the ends together, as has been proposed. The more lightly-shaded part D of brush A indicates the portion made solid, as described. The hole E, the whole of the reduced end, and the shoulders J are in the solid portion.

When part A is first used, it may be without F, and when it becomes worn so as to be too short for convenient use by itself the extension F can be secured thereto and the contact part A utilized to the solid end D. Parts A and F being of the same or similar cross-section can each be held by the same brush-holder. Only one bolt I is necessary in the construction shown, since the grooves in arms G prevent parts A and F turning independently of each other. Other means than that shown may be used to hold parts A and F in line with each other.

I claim—

1. The combination of a commutator-brush of material adapted to rub on a commutator, an extension-piece of similar cross-section to the brush, and means for fastening the brush and extension together.

2. The combination of a commutator-brush of yielding or fragile material, the outer end thereof being reinforced, an extension-piece fitted thereto, and means securing the brush and extension together.

3. The combination of a commutator-brush of yielding or fragile material, the outer end

being made solid or reinforced, said end being reduced and perforated transversely, an extension fitted to the reduced end, and a bolt or pin passing through said perforation
5 for holding the brush and extension together.

4. The combination of a brush A, having a solid portion D, a reduced end C, and hole E in the solid part, and an extension-piece F,

having arms G, the inner sides of which are grooved to fit end C, and bolt I passing to through arms G and end C.

Signed this 5th day of May, 1896.

ALDRED K. WARREN.

Witnesses:

A. HENRY MOSLE,

S. STANMORE.