

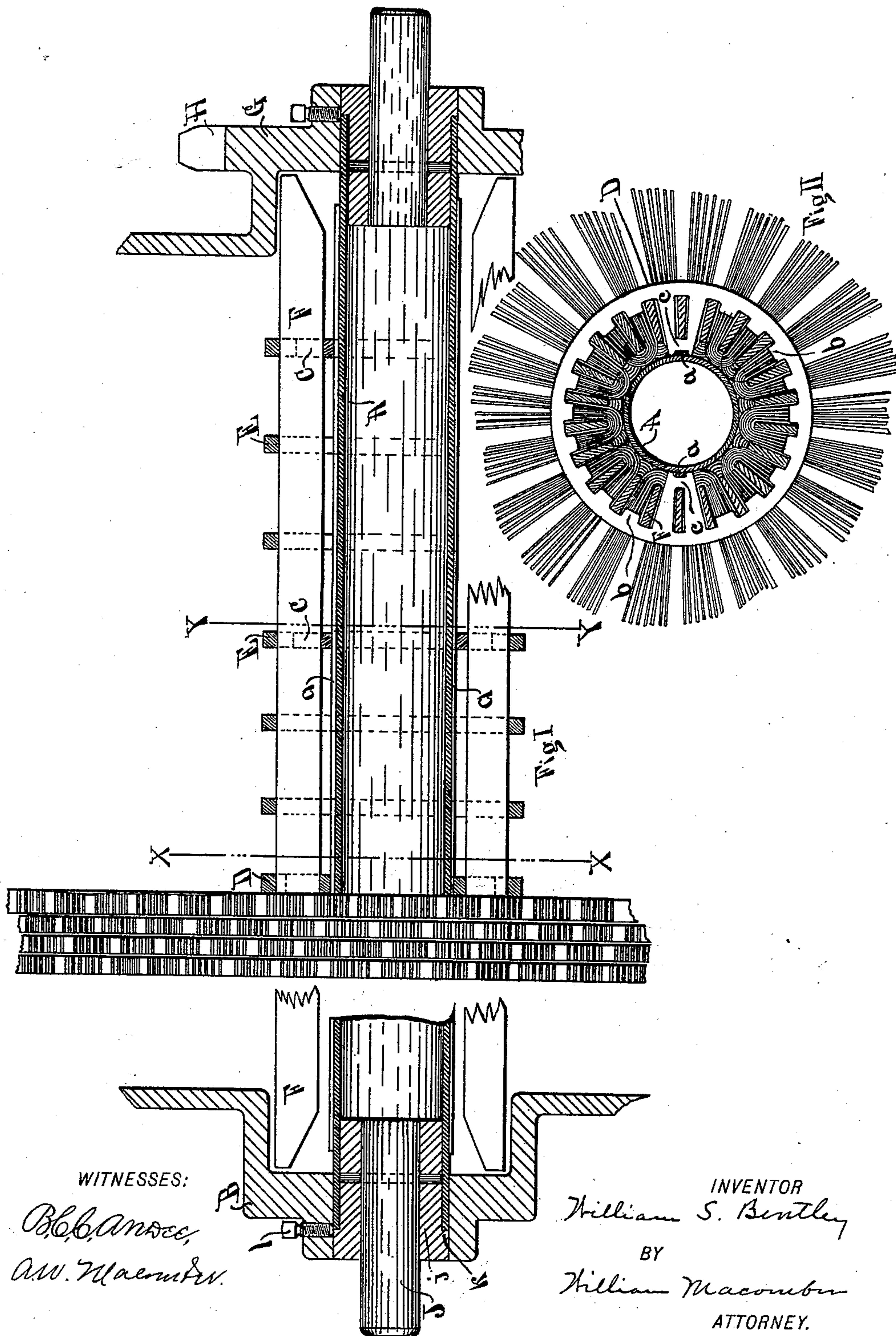
(No Model.)

2 Sheets—Sheet 1.

W. S. BENTLEY.
BRUSH.

No. 539,027.

Patented May 14, 1895.



WITNESSES:

B. B. Andee,
A. W. Macomber.

INVENTOR

William S. Bentley

BY

William Macomber

ATTORNEY.

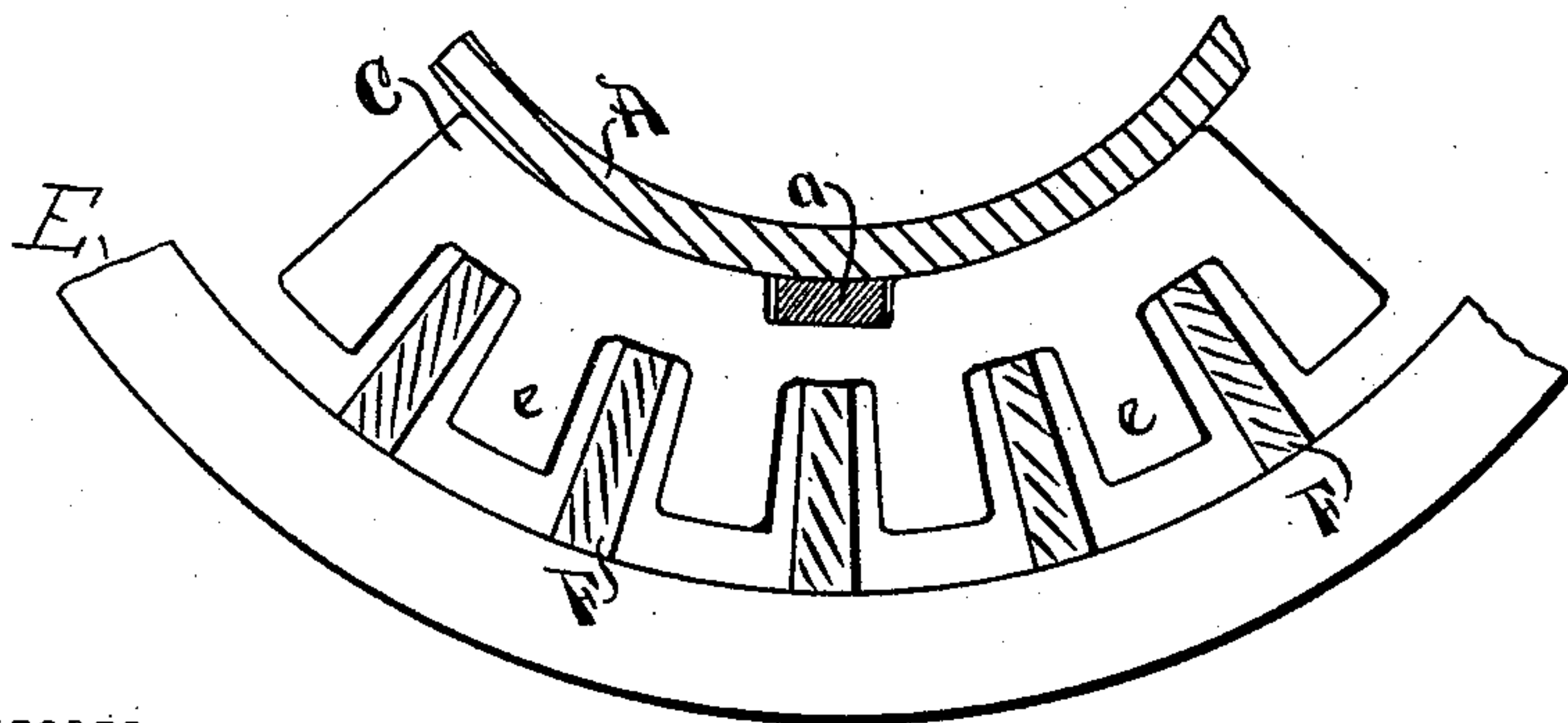
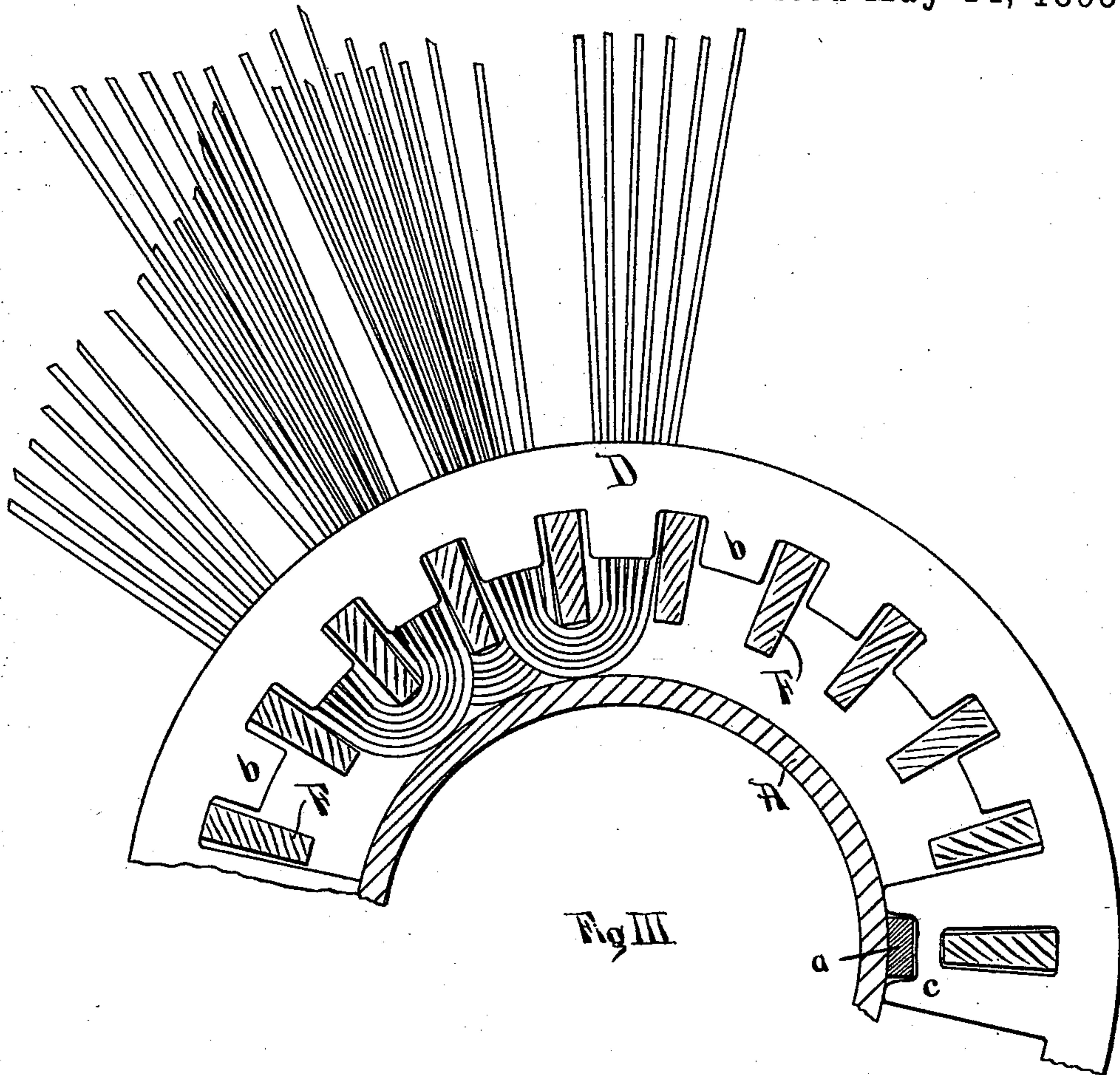
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WITNESSES:

B. C. Andee,
W. W. Macomber.

Fig. IV

INVENTOR
William S. Bentley

BY
William Macomber
ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIAM S. BENTLEY, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-HALF
TO CHARLES D. ZIMMERMAN, OF SAME PLACE.

BRUSH.

SPECIFICATION forming part of Letters Patent No. 539,027, dated May 14, 1895.

Application filed October 30, 1894. Serial No. 527,408. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. BENTLEY, a citizen of the United States, residing at the city of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Brushes, of which the following is a full, clear, and exact description.

My invention relates to brushes, and more particularly to that class of brushes in which the splint or brush material is held in place frictionally and without the assistance of glue or cement, and which are capable of being knocked down and refilled.

The object of my invention is to provide a brush which is lighter in weight than similar brushes hitherto made, which holds a larger amount of splint or brush material, which has a smaller cylinder and a larger brush surface, which is simple, strong and durable, and which may be filled, emptied and refilled with the greatest economy and facility and without the use of glue or other retaining substance.

My invention is applicable especially to brushes cylindrical in form, which are used for sweeping, scouring and cleaning; and while I have employed my said invention chiefly in street-sweepers, I do not limit my invention to any specific use.

Referring to the drawings herewith, consisting of two sheets, Figure I is a longitudinal view of a brush-frame in section and showing a small amount of the brush material inserted. Fig. II is a cross-section on the line *xx*, Fig. I. Fig. III is an enlarged partial cross-section on the line *xx*, Fig. I, showing more clearly the manner of inserting the brush material. Fig. IV is an enlarged partial cross-section on the line *yy*, Fig. I.

A is a cylindrical body, which may be made of iron or other suitable material. Upon this tube and diametrically opposite each other I place two longitudinal strips or splines, *a, a*, as clearly shown in Figs. I and II. To one end of this cylinder I secure a retaining plate, made in any desired form, as indicated at B, Fig. I; and as I have shown a brush in this drawing such as I employ in sweepers, the parts may be more fully described, although this special form of construction is not essential. Fitting within the cylinder, A, is the journal J, which has a bushing, *j*, secured to it and which fits

into and is keyed to the cylinder, A. This bushing has a flange, *k*, which abuts snugly against the end of the cylinder. The retaining plate, B, fits on over the cylinder and has a set screw, *l*, to hold it in place. This plate has also an internal cylindrical opening to receive the ends of the slats as hereinafter more fully described.

Upon the cylinder, A, I place a notched or toothed ring, D, as clearly shown in Figs. II and III. This ring has inwardly projecting teeth, *b, b*, and two pairs of these teeth diametrically opposite are prolonged and united, as shown at *c, c*, Figs. II and III, so as to take over the splines, *a, a*, for the purpose of holding the ring against rotation, but leaving it free to slide longitudinally upon the cylinder, A.

E, E, are plain retaining rings, the interior diameter of which is equal to that of the toothed ring, D, to the base of the teeth.

C, C, Figs. I and IV, are segments of gears, which are grooved to take over the splines, *a, a*, and which have external teeth, *e, e*, which engage with the slats as hereinafter described.

About the cylinder, A, and fitting into the notches of the toothed ring D, and the teeth, *e, e*, of the segments, C, C, I place strips or slats, which should be made of a durable material. These slats are indicated at F, F. I preferably make these slats slightly beveled upon their sides, so that when in place these sides will be radial rather than parallel, as this construction gives me the best bearing surfaces for the brush material. These slats should fit rather freely within the notches of the ring and the segments so that the material may be the more readily removed for the purposes of refilling. These slats should be of such depth as to leave a free space between their inner edges and the face of the cylinder, A, as will be equal to the free space between any two of the slats, thus giving the splint or brush material a bearing against the three sides of each slat.

The splint or brush material is bent into a U form in bunches and engages over these slats.

My method of construction will be best seen and understood from a description of my method of filling the brush. Having inserted

the slats, F, F, within the toothed ring, D, and about the cylinder, A, at the middle longitudinally, I first insert in place an entire series of brush material upon alternate slats. Then
 5 I place another series of the material upon the other alternate slats. This operation I repeat, carefully preserving the alternation, until I have filled some distance according to the size and character of the brush, when I
 10 slip on one of the retaining rings, E. Then I continue and repeat the process until such a quantity has been inserted that a pair of the gear segments, C, C, should be inserted. These are readily slipped in, engaging with
 15 the splines, *a, a*, and with a sufficient number of the slats, F, F, by means of the teeth, *e, e*, to act in holding the cylinder against rotation within the slats. Then I slip on over the segments a plain retaining ring, E,
 20 which serves to hold the slats well down to the teeth of the segments. This operation continues until one-half of the brush is filled, when I reverse ends and fill the other half. When the brush is filled I place the retaining
 25 plate, B, in place and secure it to the cylinder by the set screw. I am then ready to compress the material by the compression plate G, the construction of which is substantially the same as that of the retaining plate
 30 B. In the drawings I have shown this plate carrying a sprocket-wheel, H, such as I commonly employ in sweepers. This plate, like the other has an internal cylindrical opening which takes over the slats. In order that the
 35 brush material may be compacted, I fill in more material than will allow the plate G to go to place without pressure, and this excess of brush material will be greater or less according to the compressibility of the material
 40 used. I then force the plate, G, to place,

either by screw or hydraulic pressure, and secure it by the set screw. As all of the rings and segments and the brush material are free to slide longitudinally toward the retaining plate, B, the brush will be equally compacted
 45 throughout its length.

When the brush material is worn out the process of emptying is simple. By removing the end plates the slats, rings and segments may be rapidly removed and again used in
 50 refilling the brush.

Having thus described my invention, I claim—

1. In a brush, a cylinder, longitudinal slats, gear segments, retaining rings, said gear segments splined to said cylinder and having
 55 teeth engaging with said slats, a retaining plate taking over said slats and engaged to one end of said cylinder and a compression plate taking said slats and engaging to the
 60 other end of said cylinder, for the purposes set forth.

2. A knock-down brush having a cylinder and longitudinal slats, a toothed ring and gear segments engaging said slats with said
 65 cylinder, retaining rings upon said slats and brush material engaging with said slats, said ring, segments, retaining rings and brush material being free to slide longitudinally, and
 70 a retaining plate and a compression plate for compacting said brush material, substantially as and for the purposes set forth.

In testimony that I claim the foregoing invention I hereunto set my hand, this 27th day of October, 1894, in the presence of two witnesses.

WILLIAM S. BENTLEY.

Witnesses:

C. D. ZIMMERMAN,
 A. W. MACOMBER.