

(No Model.)

2 Sheets—Sheet 1.

W. S. ELLIOTT.  
RUBBER DAM CLAMP.

No. 335,747.

Patented Feb. 9, 1886.

FIG. 1.

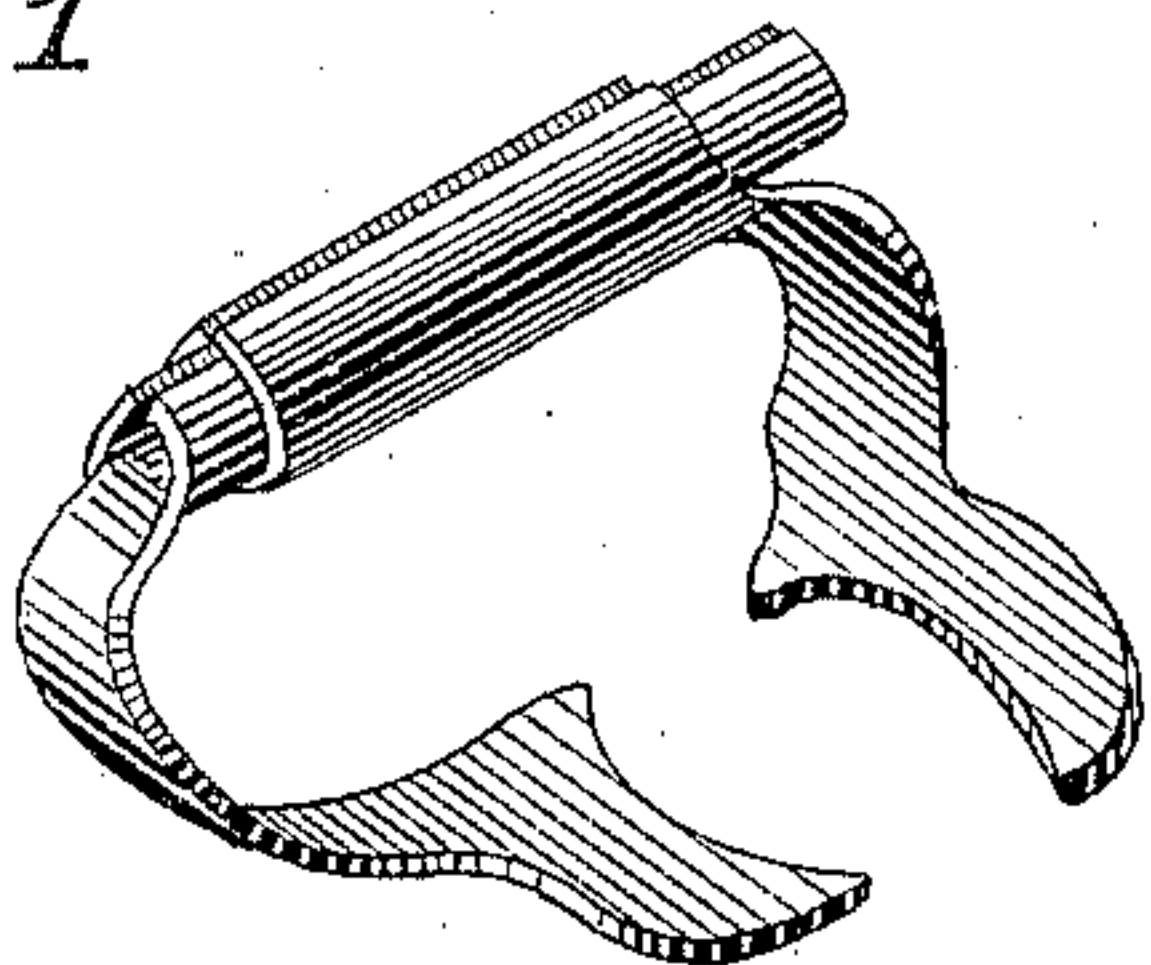


FIG. 2.

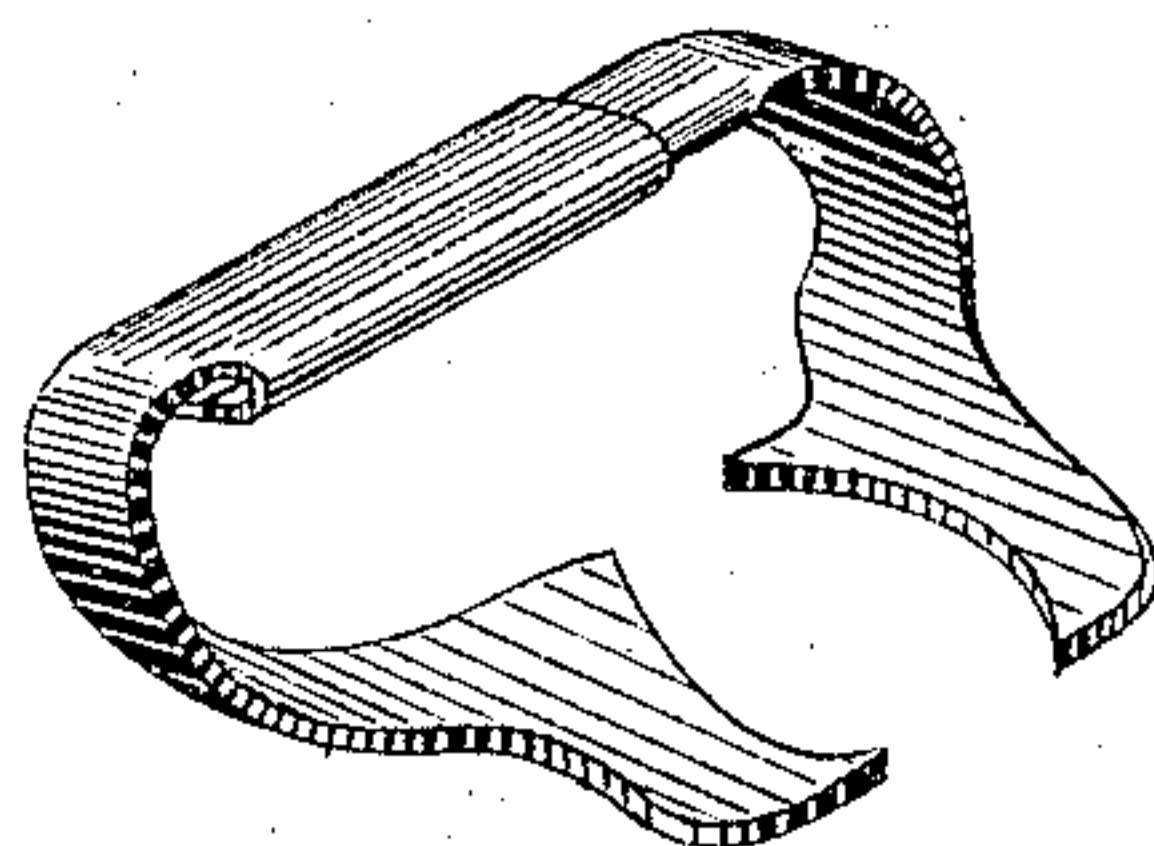


FIG. 3.

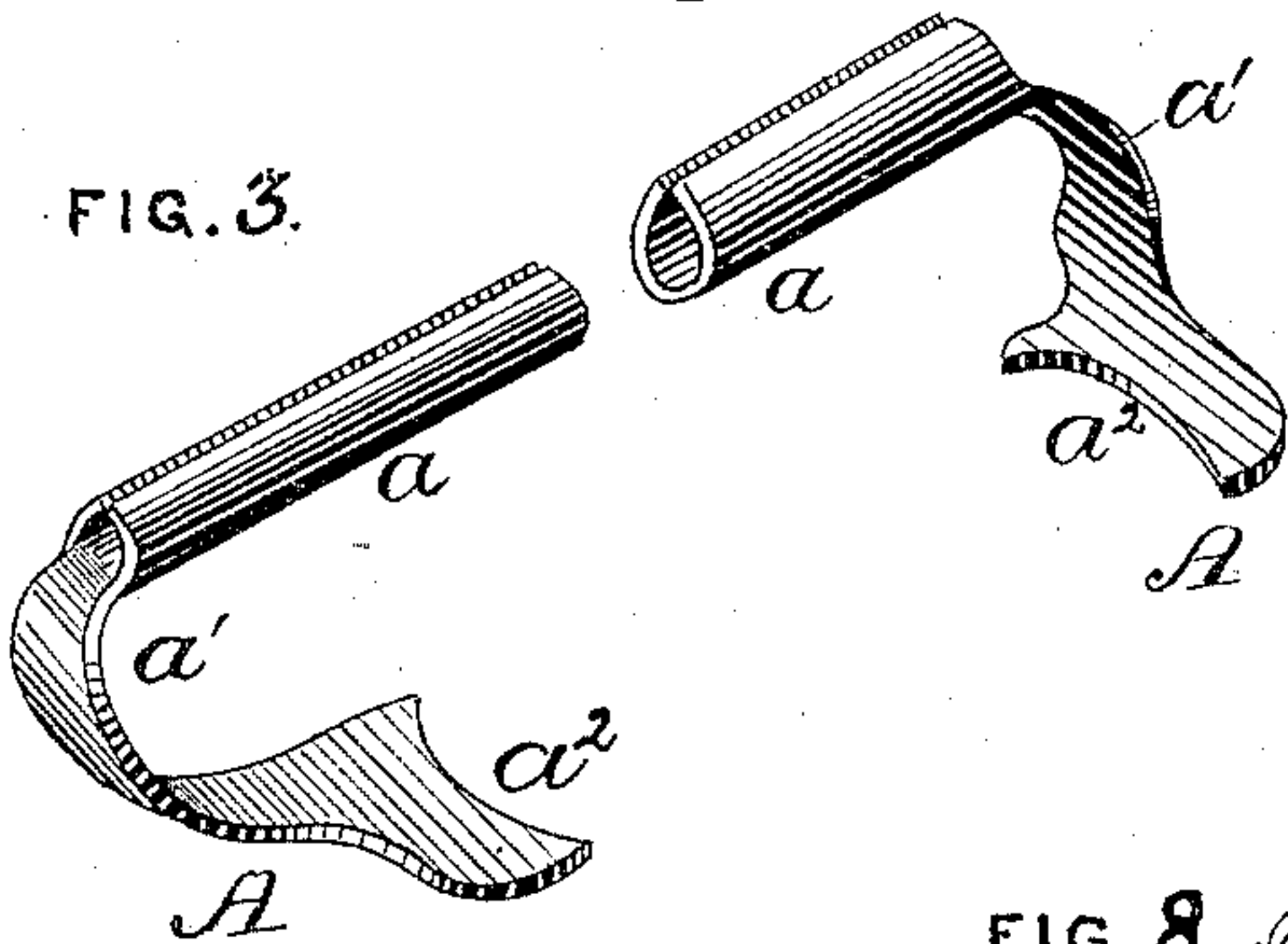


FIG. 4.

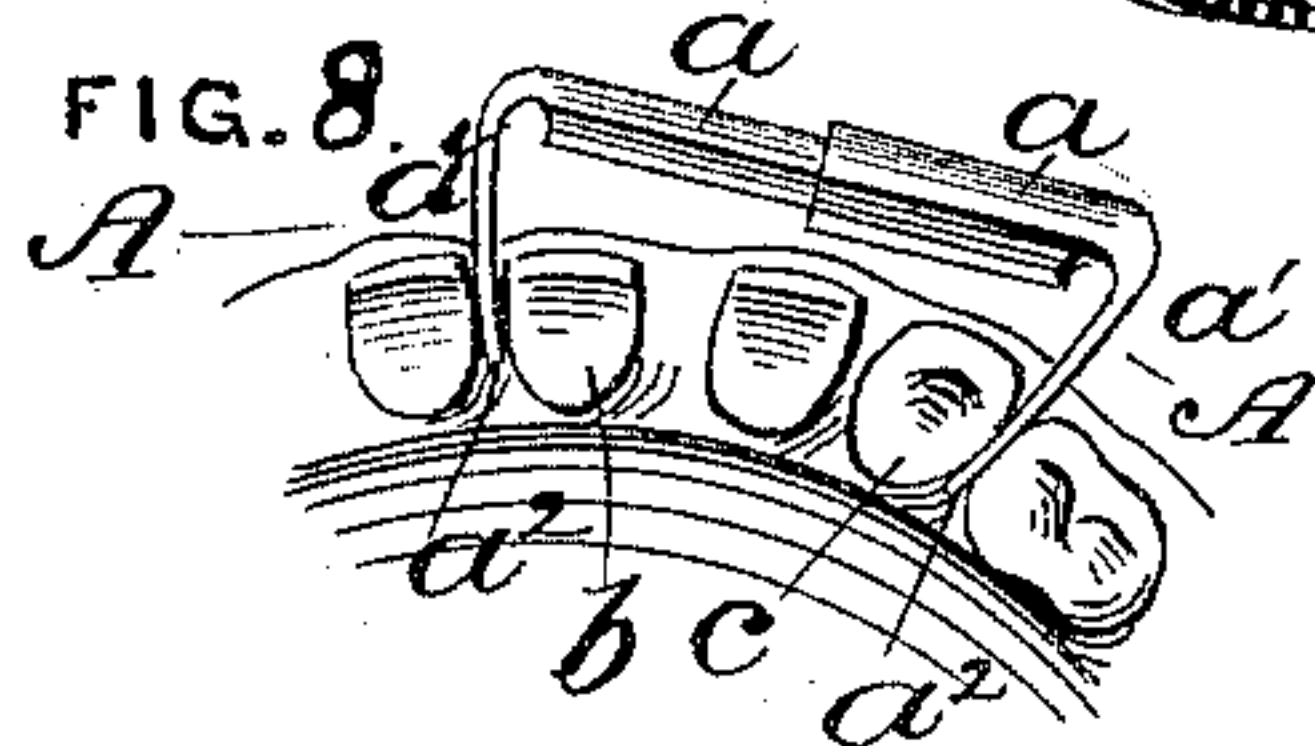
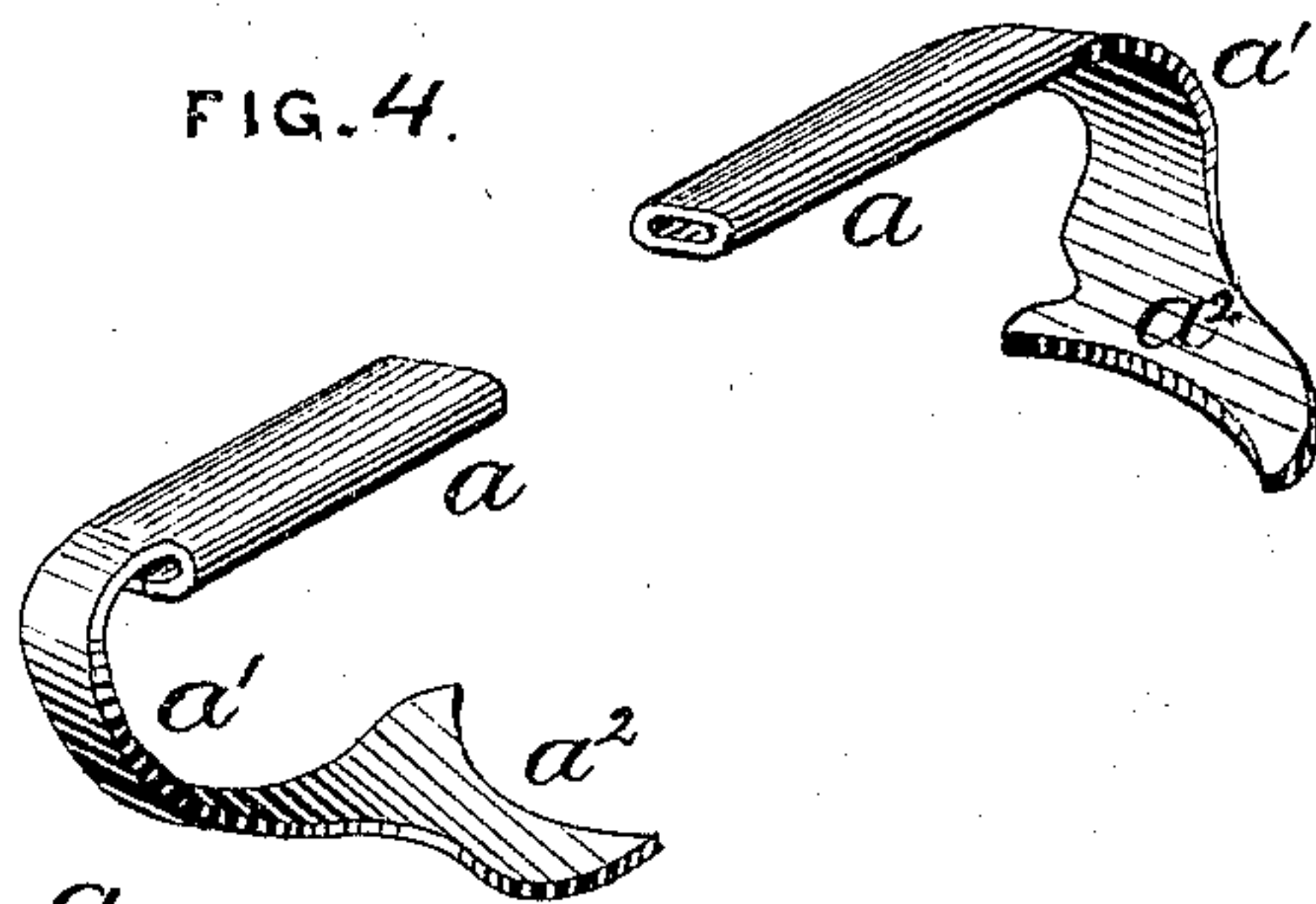


FIG. 5.

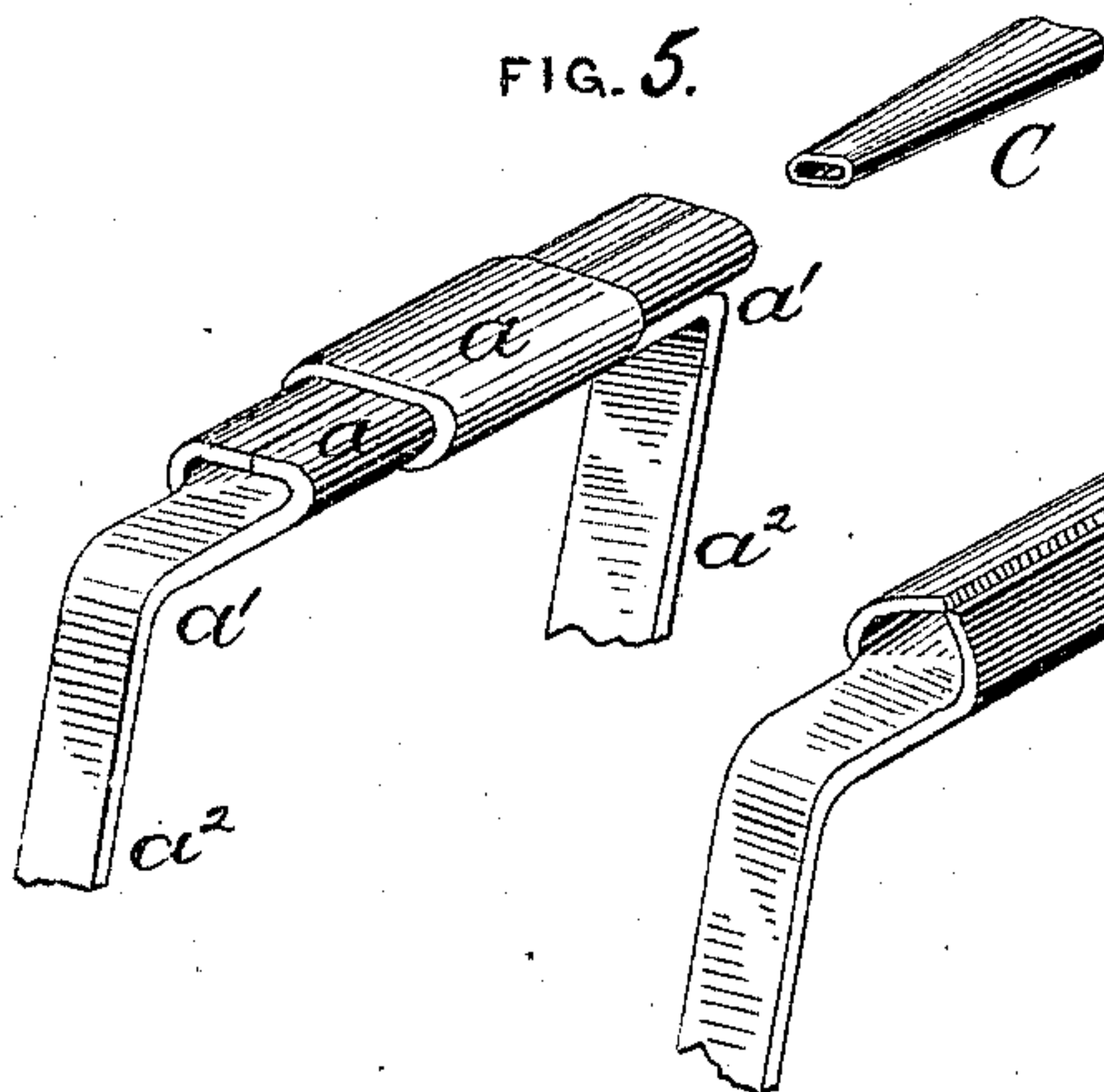


FIG. 6.

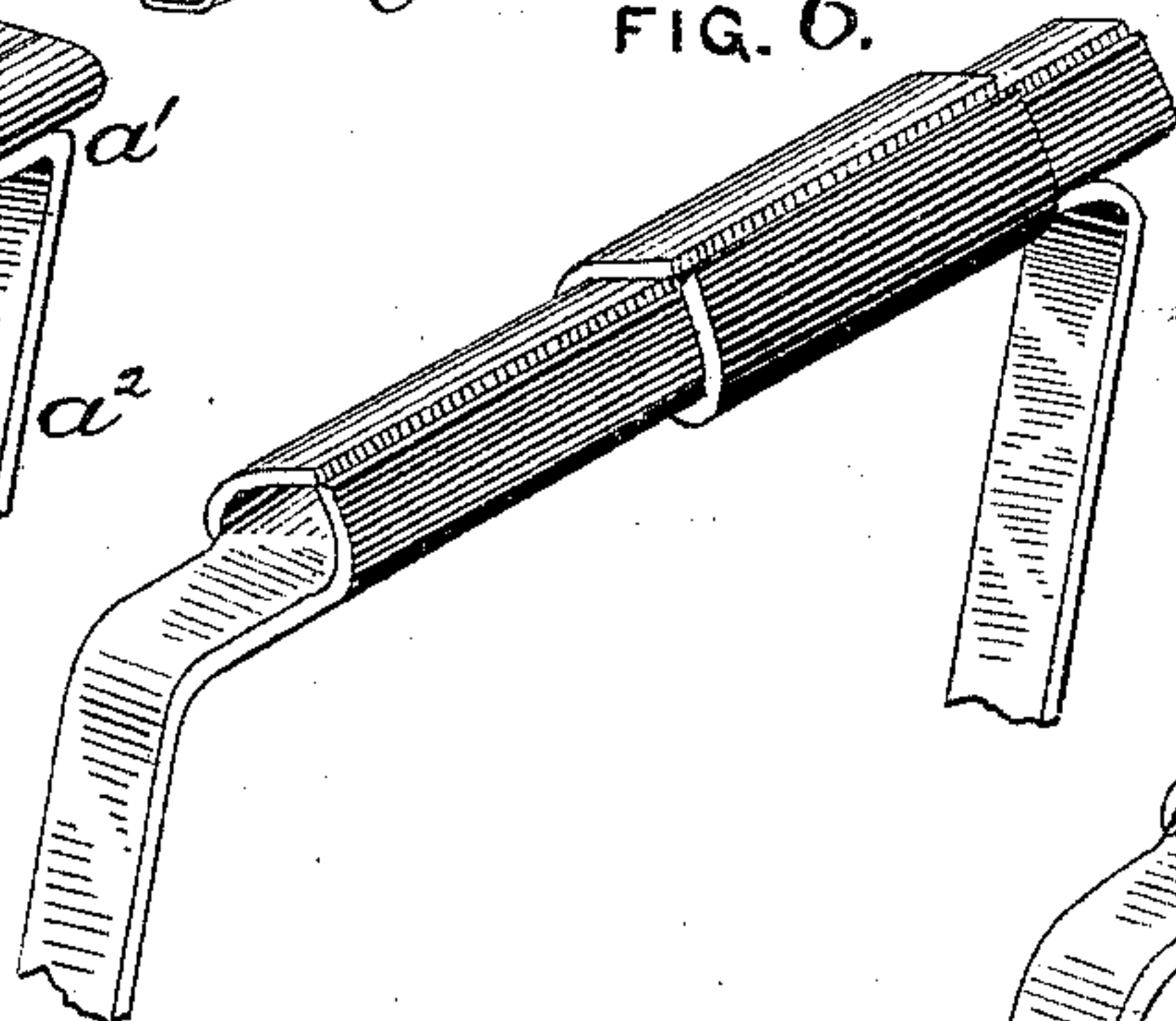
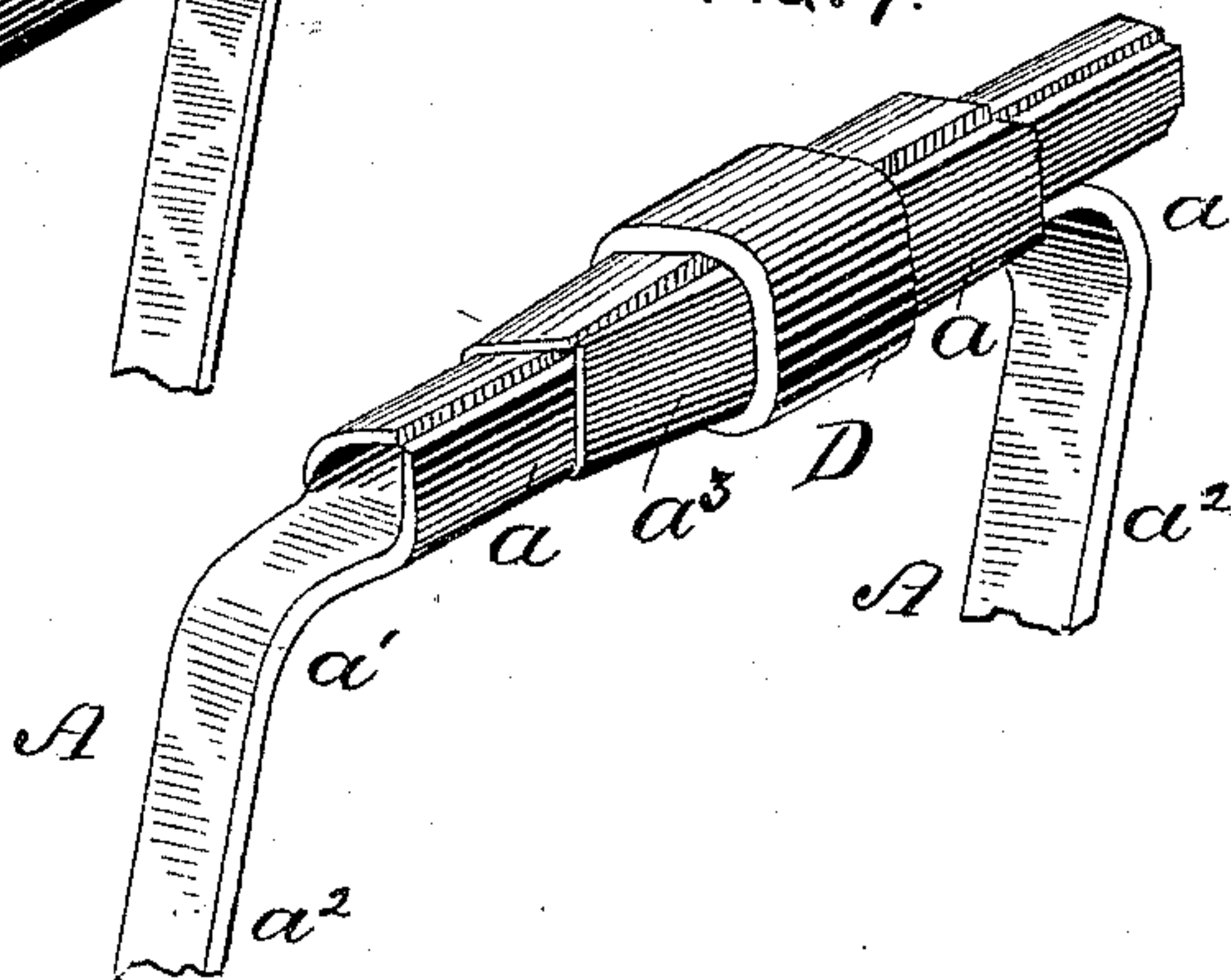


FIG. 7.



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Baldwin, Hopkins & Peyton

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FIG. 10.

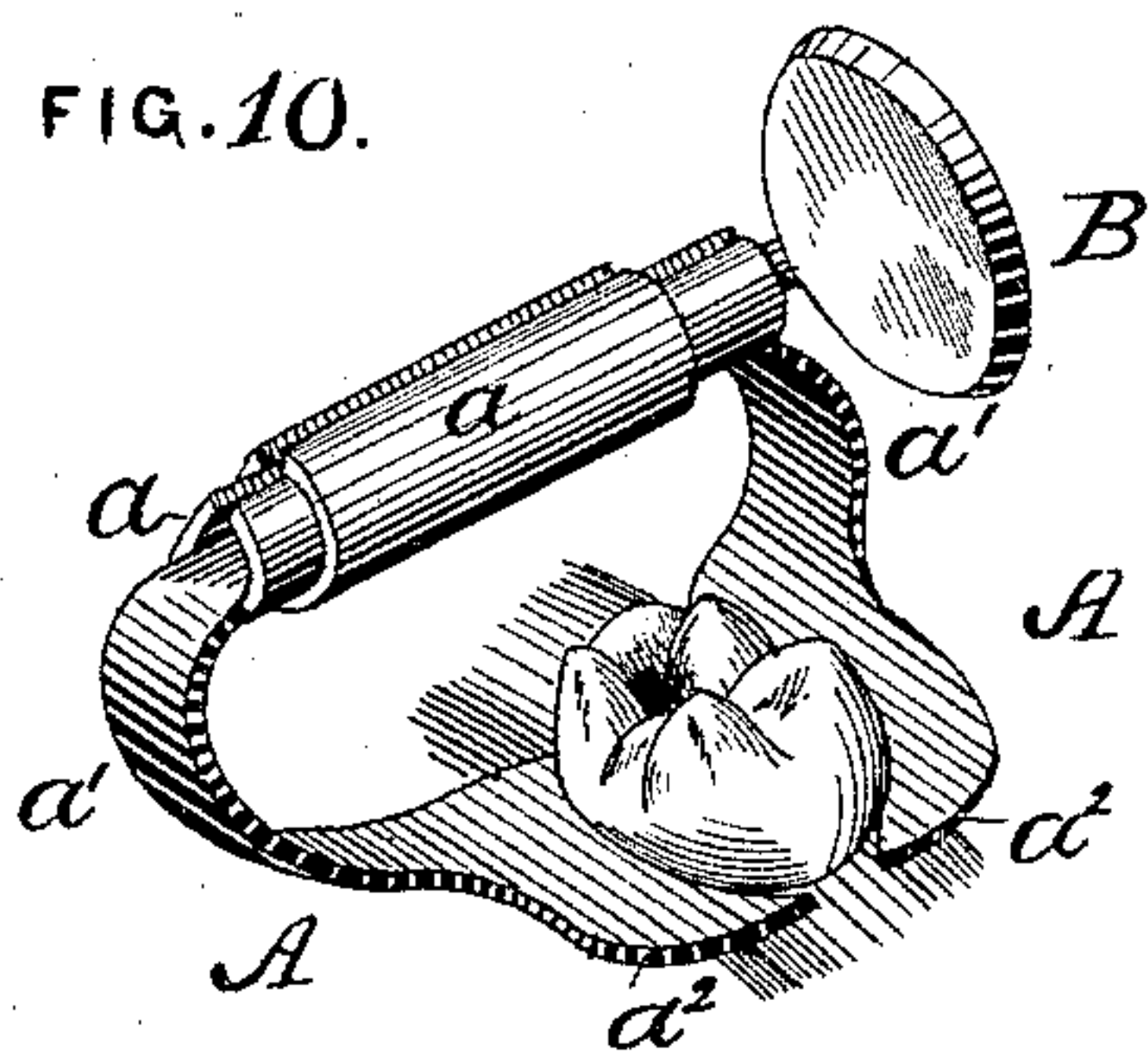


FIG. 11.

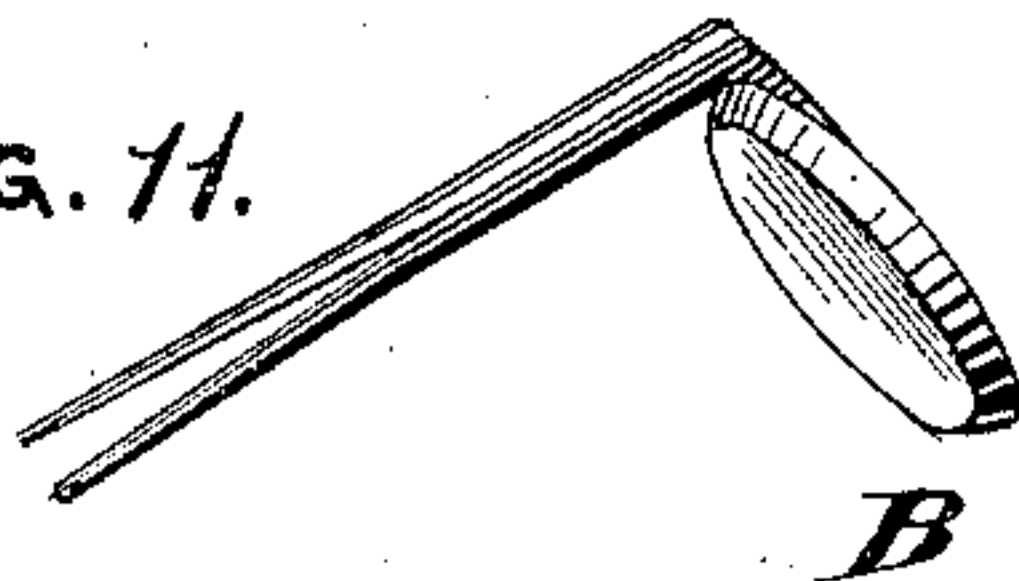
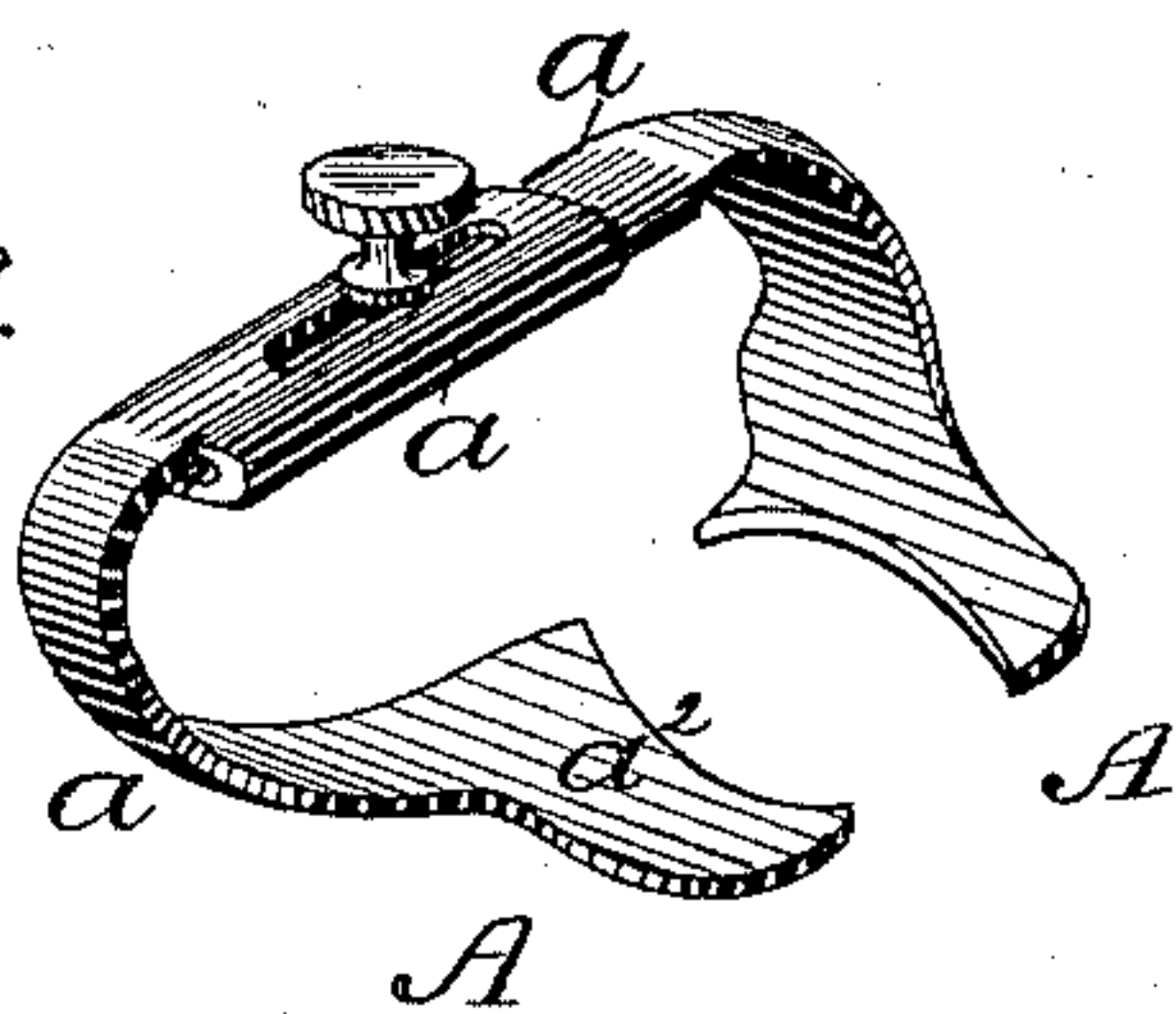


FIG. 9.



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# UNITED STATES PATENT OFFICE.

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## RUBBER-DAM CLAMP.

SPECIFICATION forming part of Letters Patent No. 335,747, dated February 9, 1886.

Application filed March 28, 1884. Serial No. 125,838. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER SCOTT ELLIOTT, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Clamps for Dental Dams, of which the following is a specification.

My invention relates to devices for securing sheet-rubber in place about teeth while they are being operated upon, and for other cognate purposes, some of which will be designated hereinafter.

In filling teeth, and in some other dental operations, it is desirable to prevent the saliva or moisture from coming in contact with the tooth being operated upon, and fluids or medicines from coming in contact with the gums and lips of the patient while a tooth is being treated; and for this purpose a so-called "dam" is commonly employed, which consists of sheet-rubber having one or more punctures or openings, therein by which the rubber is slipped over the tooth or teeth. This rubber is generally held in place by means of metallic clamps, which are commonly known as "rubber-dam clamps." As heretofore constructed these clamps are objectionable for several reasons. Prominent among these objections is the large size of the clamps, and also their stiffness, due to want of adaptability or adjustability, which oftentimes causes pain to the patient when applied to a sensitive tooth or teeth.

The principal object of my invention is to obviate the objections heretofore experienced with rubber-dam clamps; and to this end I construct a clamp in sections, telescoping one upon the other, or adjustable, whereby the clamp may be adjusted to suit the particular operation in hand, and whereby also the degree of pressure exerted by the clamp upon the tooth or teeth may be regulated or determined.

Another object of my invention is to provide a spring-clamp by which natural teeth may be regulated by either forcing the teeth apart or drawing them together, as the case may require.

The subject-matter claimed herein as of my invention is first particularly described in detail as embodied in the best ways now known

to me, and is then distinctly recited at the close of the specification.

Some of my improvements may be used without the others.

In the accompanying drawings, Figure 1 is a perspective view of my improved spring-clamp organized as a rubber-dam clamp, and Fig. 2 is a similar view of a modification thereof. Figs. 3 and 4 are views, respectively, of the clamps shown in Figs. 1 and 2, with the sections thereof separated. Fig. 5 is another modification of my improved spring-clamp adapted for spacing or regulating the position of teeth, for instance; and Figs. 6 and 7 are other modifications thereof. Fig. 8 is a view of my improved clamp as applied to the natural teeth in the mouth for spacing or regulating them. Fig. 9 is a perspective view of still another modification of my improved clamp organized as a rubber-dam clamp; and Fig. 10 is a perspective view of my improved clamp, showing it as fitted with a mouth mirror or reflector to throw or reflect light into the cavity of the tooth being operated upon, or, in a well-known manner of working by dentists, to enable the filling operation to be better performed by working from the image in the mirror; and Fig. 11 is a view of a mirror with a spring-shank adapted to be fitted in the clamp.

I will first describe my improved spring-clamp as a rubber-dam clamp. The clamp preferably consists of two sections, A A, of spring metal, which clamp-sections preferably consist of a sliding or adjustable portion, *a*, a curve or spring portion, *a'*, and a biting or acting portion or end, *a''*. The sliding portions *a* of the two sections are preferably tubes, and the sliding portion of one section is of less diameter than that of the other, so that the sliding portion of one section may be fitted snugly in the sliding portion of the other section, or be capable of telescoping therein, so as to permit the two sections to be adjusted toward or from each other. The fit of the sliding portions of the two sections is such that considerable friction is exerted between the two, so that when the sections are adjusted one upon the other they will remain in their adjusted positions until positively moved.

The spring portions *a'* of the clamp-sections



tions are curved or bent, and the lower or clamping ends,  $a^2$ , of said sections are suitably shaped to encircle the neck or cervical walls of a tooth, so as to secure a firm bite or hold thereon.

When constructed as a rubber-dam clamp, the lower or clamping ends of the sections of the spring-clamp are preferably constructed in the usual manner of constructing rubber-dam clamps, and as shown in Figs. 1, 2, 3, 4, 9, and 10 of the drawings. It will be understood, of course, that different forms may be given to the lower or clamping ends of the clamp-sections in order to suit particular cases, and to snugly fit and bite upon teeth of different shapes or contours at their cervical walls.

The spring-clamp is preferably constructed of light plate spring-steel, and the sliding portions are bent over so as to form split tubes, whereby the tubes, one of which slides or is adjustable in the other, have also a spring tendency, so as to render the adjustability of the sections easy, while at the same time a locking tendency when the adjustment is made is attained. Instead of relying, however, solely upon the friction to lock the sections in position, I may employ an additional locking device, such as a set-screw, as shown in Fig. 9, or a wedge, as in Fig. 5, or a sliding sleeve working upon a tapered surface, as in Fig. 7.

I prefer that the sliding or telescoping portions of the clamp-sections be square, angular, or other corresponding shape in cross-section, instead of being round or cylindrical, in order to prevent the sections turning or moving upon each other laterally.

I have stated that I prefer to construct the clamp-sections each of a single piece of flat spring-steel; but obviously the sliding or telescoping portions may be solid and fitted to each other by a dovetail tongue and groove, for instance; or other constructions may be employed which permit the sections to be adjusted upon or relatively to each other.

In applying the clamp to secure the rubber dam in place after it has been placed over a tooth and forced down next to the gum, the sections of the clamp are adjusted toward or from each other to secure the desired fit, and the lower spring ends are then expanded by a suitable implement and fitted over the tooth-crown and down upon the cervical walls of the tooth, in the usual manner.

It will be obvious that by the adjustability given the clamp-sections the desired strength of clamping action may be exactly attained, and more or less brought into action, as the particular case necessitates or will admit of, it being painful to apply a very strong clamp to some sensitive teeth.

It will be obvious that in expanding the lower or clamping ends of the clamp the action will not tend to separate or vary the adjustment of the clamp-sections upon each other, even when no additional locking device is em-

ployed other than friction; but, as before stated, the set-screw or other additional locking device may be employed. By expanding the lower or clamping ends of the clamp the friction of the telescoping parts will be still further increased, owing to the fact that the pressure in expanding the ends of the clamp causes a lateral or binding action to be exerted by one telescoping portion of the clamp upon the other.

In Fig. 10 I have shown the inner tube of the adjustable clamp as fitted with a mouth mirror or reflector, B, to aid the dentist in his operations in well-understood ways. Instead of fitting the mouth mirror or reflector in the clamp, it may receive a suitably-constructed tongue-holder or cheek-distender, as may be desired.

In Fig. 8 I have shown my improved clamp as applied to the regulation of natural teeth, the action of the clamp in the example illustrated in said Fig. 8 being to separate two teeth,  $b$   $c$ , from adjacent teeth, or, in other words, draw them toward each other, so as to enable sufficient space to be formed between the teeth acted upon by the clamp and the adjacent teeth to enable dental operations to be performed, for instance, upon the approximate walls of said adjacent teeth. In this case, like in the organization of the clamp as a rubber-dam clamp, the sections of the clamp are adjusted to suit the particular case in hand, and then the clamping or acting ends sprung apart or pressed toward each other, as the case may be, and inserted at the points to do the work required, whether that be to draw teeth together or push them away or separate them. In this case, as in the action of the clamp as a rubber-dam clamp, the spring of the acting ends of the clamp is relied upon, and may exert its action without interfering with the adjusted or fixed position of the sections one upon the other.

In Fig. 5 a wedge, C, is shown, which may be forced into the inner tube to spread it, and thereby act as an additional means of locking two clamp-sections together.

In Fig. 7 the outside surface of the outer tube is tapered, as at  $a^3$ , and the sleeve D is fitted to be moved endwise thereon, so as to contract the walls of said outer tube upon those of the inner tube, and thus also act as an additional means of locking the sections together when adjusted.

Having thus described my improvements sufficiently to enable them to be understood, and some of the ways of employing them, I would have it understood that I claim as my invention—

1. A spring-clamp consisting of adjustable telescoping sections, each of said sections having an adjustable telescoping portion, a spring portion, and an acting end or portion, substantially as described.

2. The spring-clamp consisting of two adjustable telescoping sections, each of which has an adjustable telescoping portion, a spring



portion, and an acting end or portion, in combination and fitted with a separate locking device, substantially as described, whereby the spring-pressure of the clamp may be varied  
5 and the sections thereof positively locked in their adjusted position by means other than friction.

3. A sectional adjustable telescoping spring-clamp, one member of which consists of a tubu-

lar sliding or adjustable portion, a bent or 10 spring portion, and an operating end or portion, substantially as described.

In testimony whereof I have hereunto subscribed my name.

WALTER SCOTT ELLIOTT.

Witnesses:

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WM. H. RIBLET.