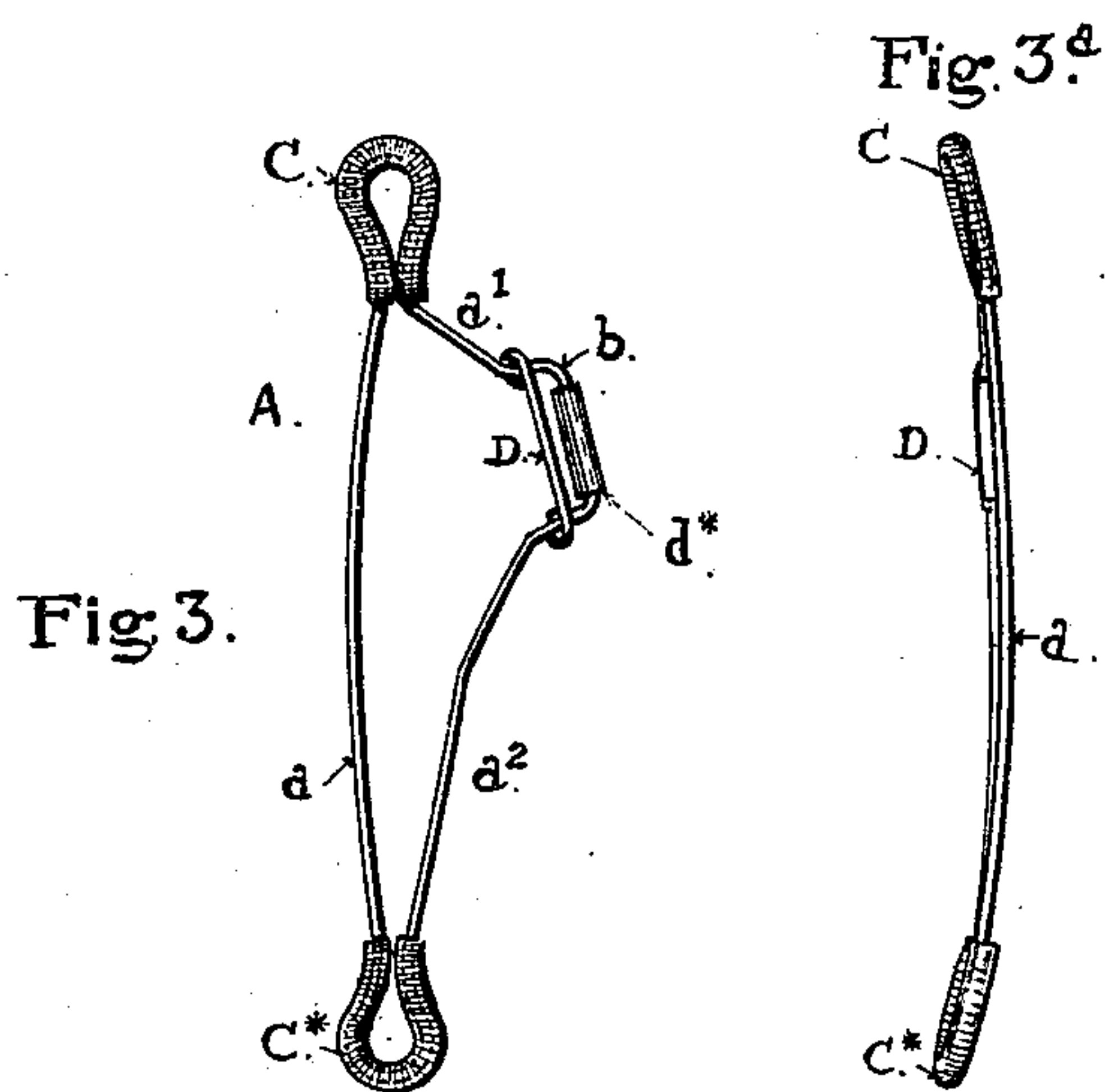
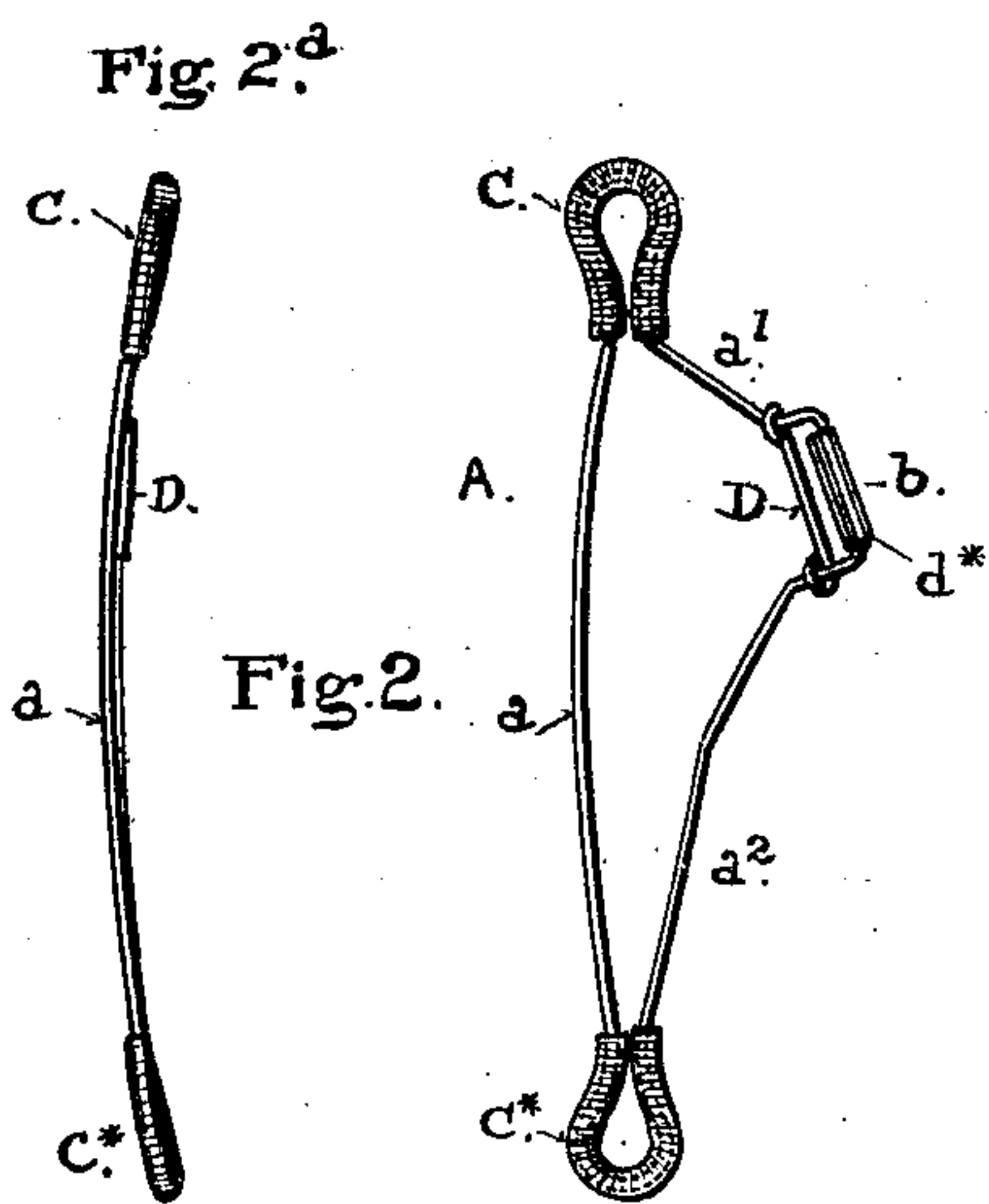
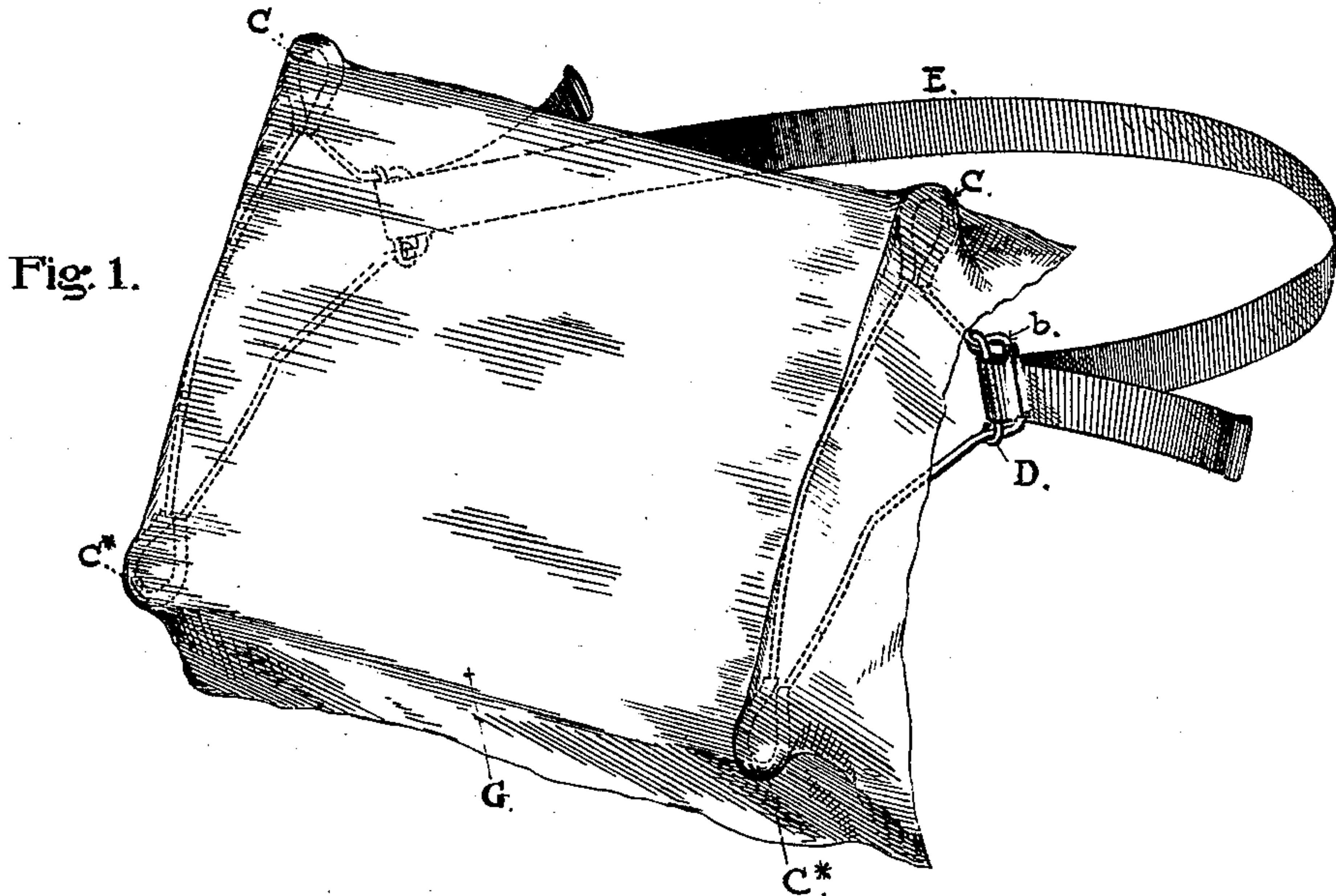


(No Model.)

S. E. KNOWLES.
RUBBER DAM CLAMP.

No. 587,058.

Patented July 27, 1897.



Witnesses:

Marcus S. Leve.
M. H. H. H.

Inventor:

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UNITED STATES PATENT OFFICE.

SAMUEL E. KNOWLES, OF ALAMEDA, CALIFORNIA.

RUBBER-DAM CLAMP.

SPECIFICATION forming part of Letters Patent No. 587,058, dated July 27, 1897.

Application filed February 1, 1897. Serial No. 621,464. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL E. KNOWLES, a citizen of the United States, residing in Alameda, in the county of Alameda and State of California, have invented certain new and useful Improvements in Rubber-Dam Holders, of which the following is a specification.

This invention relates to improvements made in devices for holding the rubber-dam in position on the patient in dental operations.

It has for its object to produce a device that will stretch the sheet of rubber smoothly over the patient's mouth and hold it with any required degree of traction, both longitudinally and transversely, with reference to the fissure of the mouth, without the use of weights and without danger of puncturing or tearing the rubber, and generally to secure conditions of greater comfort to the patient and greater convenience to the operator than accompany the use of the ordinary holder and weights.

To such ends and objects my said invention consists in certain novel construction and combination of parts, as hereinafter fully described, and pointed out in the claims at the end of this specification, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of the complete device, representing the rubber-dam stretched upon the holder and the parts in the position they occupy when on the patient. Figs. 2 and 3 are side views of the two parts of the holder without the connecting-strap, and Figs. 2^a and 3^a front views of the same parts.

The parts A A are made of wire chiefly for the sake of lightness and cleanliness. In its general outline each one has approximately the shape of an irregular triangle, the base or longer side of which is presented to the front, and the apex is turned to the rear when the part is in position on the cheek of the patient. The longer side a is made of suitable length to bring one end or tip a' somewhat above the line of the upper lip and the opposite end or tip a^2 a greater distance below the line of the lower lip when the holder is in position. These ends a' a^2 are covered with a padding of some substance or material of soft quality or texture, such as rubber or leather, for the purpose of securing suitable adhesion

or holding power on the sheet-rubber forming the dam and of preventing the end of the holder from cutting through the rubber. The wire is bent at these points in a short but smooth curve back upon itself, to form a rounded end or tip over which the dam can be stretched without danger of puncturing or tearing it. Soft-rubber tubing will be found a good material for covering the end of the holder to form the tip, a short piece of the same being slipped on the wire before the loop is closed.

The upper side or member a^3 is considerably shorter than the lower member a^4 , and at the junction of the two, which corresponds to the apex of the triangle, is placed a buckle or means for attaching the strap B that connects the frame or part A on one side with that on the other side of the patient's face.

The strap B is made of elastic braid, and by means of the fastenings before mentioned the band is attached to the two holders in such manner that the tractive force exerted by the holders is regulated at pleasure from the side on which the operator is working by slackening or by drawing up that end of the strap.

A simple and reliable grip or buckle for this purpose is formed by bending the wire into a rectangular loop D and attaching to the top and bottom members of the loop a cross-bar d in front of and parallel with the perpendicular member of the loop. The bar d is made of wire and is attached by bending its ends around the wire of the frame at the points before mentioned.

In producing the frame from a single piece of wire the ends are brought together at this loop portion and are united by a short piece of metal tubing, in which the ends of the wire are fixed by forcing them into the tube. This construction leaves all the parts of the frame without an exposed joint on any of the members and avoids the use of soldered joints. It also presents a smooth bearing-surface for the elastic strap to slip over.

In attaching the strap to the holder its end is passed from behind over the cross-bar and is thence turned from the front to the rear again and passed under the loop D or through the space between the cross-bar and the loop, in which position the cross-bar lies in the

bight or fold of the strap, while both portions of the folded strap behind the bight lie under the loop D and in contact with each other. By this means the strain or traction operates to maintain a secure hold of the buckle on the strap, and at the same time allows the strap to be shortened or taken up at any time simply by pulling on the loose end that is presented outward.

10 The frames A are curved or bowed slightly in a lateral direction or to one side out of the perpendicular, as represented in Figs. 4 and 5, the one to the right and the other in the contrary direction, to make them conform somewhat to the curvature of the cheeks, that they may lie closely on the face without bearing with more pressure at one part than at another.

As thus constructed, the holder is used by placing the parts A A upon opposite sides of the patient's face from behind, with the strap extending around the back of the neck and with the shorter limb a^3 of each frame somewhat above the line of the upper lip, care being taken to place the two frames in their proper position, according to the curvature of the long member of each frame. Then the sheet of rubber R, properly cut and placed over the tooth to be operated upon, is stretched over the tips of each holder longitudinally or in the general direction of the long member, so that by its own contraction the rubber is held over the covered tips with sufficient force to keep the dam distended smoothly and both longitudinally and transversely and under any required degree of tension. The amount or degree of tractive force necessary to draw the rubber sheet not only across the line of the mouth, but also in other

directions to hold the dam in the most effective position for all possible conditions of work, is readily regulated and applied on the required lines by drawing up the strap and stretching the marginal portions of the rubber sheet in the required direction over one tip or the other of the frame on one or both sides of the mouth. When properly adjusted, the dam will be retained in position with comfort to the patient and with the parts of the holder and the loose flaps of the dam out of the way of the operator.

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

1. In a rubber-dam holder, a skeleton frame having one longer arm or member and two shorter arms or members converging toward each other in substantially the same plane, with the bend at each end of the longer member covered with elastic material, and a buckle or fastening means for a neck-strap at the junction of the shorter members.

2. In a rubber-dam holder, the combination of a skeleton frame of triangular shape composed of a longer arm or member and two shorter arms or members, rounded dam-holding ends at the ends of the longer members, a loop formed by the junction of the shorter members and a sleeve covering the same, and a cross-bar in front of the loop, constructed for operation as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

SAMUEL E. KNOWLES. [L. S.]

Witnesses:

C. W. M. SMITH,
CHAS. E. KELLY.