

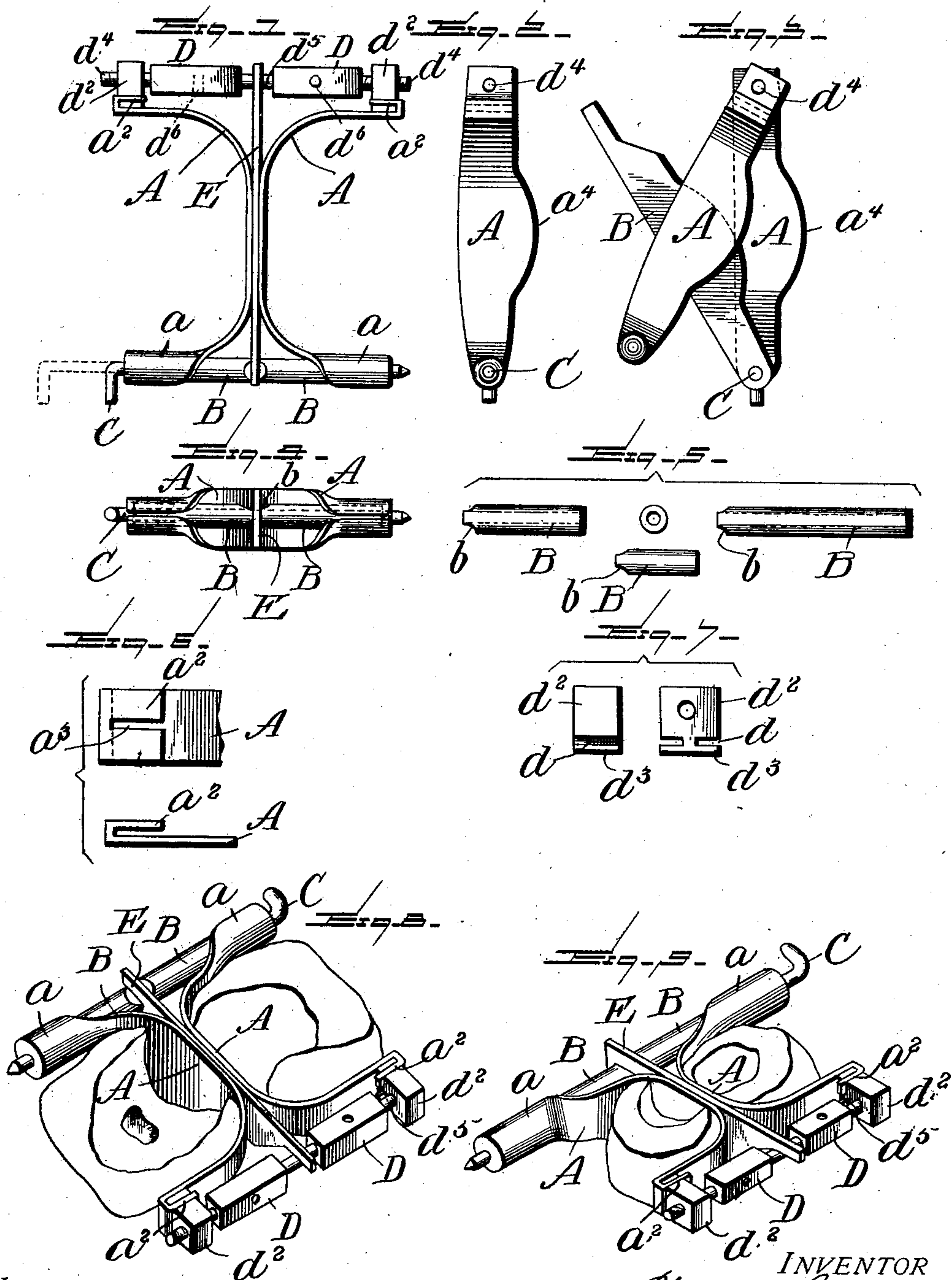
No. 701,799.

Patented June 3, 1902.

W. CRENSHAW.  
DENTAL MATRIX.

(Application filed July 27, 1901.)

(No Model.)



WITNESSES:

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BY



# UNITED STATES PATENT OFFICE.

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## DENTAL MATRIX.

SPECIFICATION forming part of Letters Patent No. 701,799, dated June 3, 1902.

Application filed July 27, 1901. Serial No. 69,985. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM CRENSHAW, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Dental Matrices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object is to produce a matrix for use in dental surgery which shall in a ready and efficient manner serve as a support while filling difficult cavities in decayed teeth, especially such cavities as extend through and include a portion of the lateral wall or surface thereof and be capable of adjustment to fit any-sized tooth. Cavities of this kind are most frequently found in the side of a tooth next an adjacent tooth, and to cause these fillings to take the shape as nearly as possible of that portion of the original tooth is an additional object.

A further object is to produce a dental matrix which shall admit of easy and quick adjustment between the teeth, shall fit closely and rigidly around and beyond the surfaces of the teeth to be filled, and be adapted for adjustment to fit various sizes of teeth, and, finally, which may be readily removed after the filling has been completed without dragging, lifting, breaking up, or in any way disturbing the margins or conformation of said filling.

With these objects in view the invention consists in the various novel details of construction and arrangement, as will be hereinafter more fully described and claimed.

The invention consists, further, in the novel construction and combination of parts of a dental matrix hereinafter described and claimed.

In the accompanying drawings, in which like letters of reference indicate corresponding parts, I have illustrated one form of embodiment of my invention, it being understood that I do not limit myself or the scope of the invention to the form shown, as various changes and modifications may be devised without departing from the spirit thereof.

In the drawings, Figure 1 is a plan view in elevation, showing the parts of my improved matrix assembled and ready for use. Fig. 2 is a side view in elevation of the same looking in the direction of the arrow  $x$  of Fig. 1. Fig. 3 is a similar view showing the parts in position for removal from between the teeth. Fig. 4 is a view in end elevation looking in the direction of the arrow  $y$ , Fig. 1. Fig. 5 is a detached view of the metal tubes or distance-pieces shown in various lengths. Fig. 6 is a detail view of one end of the strips or bands A. Fig. 7 shows in detail the construction of one of the threaded nuts. Fig. 8 is a view in perspective, showing my matrix placed in position between two teeth and ready for use; and Fig. 9 is a similar view in which the device is applied to smaller teeth, as the bicuspid, a longer distance-piece being used.

Referring to the drawings, the matrix is constructed usually of two metal bands or strips A, which may preferably be quite thin and flexible and are formed or adapted to be formed into oppositely-disposed curves or loops. At one end each band is formed with a socket or stirrup  $a$ , cylindrical in form and constricted at the outer end, which sockets are to receive the metal tubes or distance-pieces B. These tubes B are made in various lengths and may be tapered or reduced at one end, as at  $b$ , so that when assembled a suitably-shaped wedge or other device may be introduced for the purpose of separating the strips or bands, as by inserting the same over or under the bar or pin and between the flexible strips or bands A, thus forcing these bands against the cervical margin when this is necessary. These tubes are preferably secured in position by a removable pin C, upon which latter they have a rotative or pivotal movement. The other end of each strip A may be doubled upon itself to form a loop  $a^2$ , the free end of which is slitted, as at  $a^3$ , to receive the neck  $d$  of the tapped and threaded nut  $d^2$ , Figs. 6 and 7. Each nut is held in the toe of the loop  $a^2$  by the head  $d^3$ .

In order to place a tension on the strips A, a screw-bar D may be provided, having oppositely-threaded ends  $d^4$ , adapted to engage the nuts  $d^2$ , secured to the strips A, this bar being preferably squared throughout the



greater part of its length and having a reduced portion  $d^5$  near its center to permit insertion of the wedge or other device aforementioned over or under the same and to receive the end of a strip or tongue E, the opposite end of which strip is provided with a perforation, through which passes the pin C. The strip E is thus pivotally mounted between the adjacent ends of the tubes or distance-pieces B and is adapted to be drawn down between the strips A to effect separation thereof where the device is being applied between two teeth both of which are to be filled, the tongue or strip creating a space between the strips, so that when it is withdrawn they will spread somewhat to facilitate their removal from around each tooth.

Each of the three strips above mentioned is formed with a similar outline, as shown in Fig. 3, where it appears that the lower edge of the strips is provided with a bulge  $a^4$ , adapted to extend downward between the cervical margin of the tooth and the gum to form an effectual closure for the side of the cavity adjacent thereto and also for holding down the rubber-dam septum. The screw-bar D is provided with perforations  $d^6$ , extending in directions at right angles to each other to receive a key bar or pin for tightening or loosening said bar within the nuts. When the cavity to be filled is located in a large tooth, such as a large molar, two of the smaller tubes B or two of moderate length will be employed, as shown in Fig. 8, in order to lengthen or let out the bands or strips A to permit them to extend around the tooth when the device is in position. When, however, the cavity to be filled is in a small tooth, such as the small molars or bicuspid, the longest size of the bar B will be employed, thereby taking up or shortening the bands A. When the proper tubes have been inserted and the device is ready for application between the teeth, the bands are inserted between the tooth to be filled and the adjacent tooth, with the central strip E preferably in a closed position. The screw-bar D is then manipulated to force the ends of said bands apart, thereby placing them under tension and causing them to conform to the outline of the tooth. After the filling has been completed the central strip may be removed and the screw-bar D loosened, thereby relieving the tension of the bands A and the pressure upon the teeth and the filling, when the whole device may be removed from its position without in any way dragging out, breaking up, or disturbing the margin or conformation of the filling, which will be found to possess as near as possible the original outline or contour of the perfect tooth.

Many advantages are secured by constructing a dental matrix according to my invention. The device may be easily and quickly arranged to fit or to conform to teeth of any size, and may be quickly adjusted in position for use, and is practically in one piece when thus ad-

justed. The metal strips or bands which form the matrix or support for the filling proper extend practically three-fourths around each tooth and by means of the adjustable tension may be tightened to give to the filling a form approximating the original shape of the tooth. The adjustment when effected is rigid and reliable, and after the filling has been effected the device may be readily and quickly removed without in any way injuring the form or outline of the filling.

It is to be understood that one of the distance-pieces carried by the strips or bands may, if desired, be stationary and yet be within the scope of my invention.

Owing to the fact that the nuts  $d^2$  may be detachable from the strips or bands A, these strips or bands may be readily replaced by others of like or of varying width or may thus be interchanged at will. Also by withdrawing the pin C one side of the matrix may be removed without disturbing the remaining side, the part removed having a pivotal movement upon the nut  $d^2$ , as shown in Fig. 3.

The parts are of course constructed, preferably, of non-corrosive metal or metal coated or plated in such a manner as to reflect light in the cavity and be practically unaffected by the moisture, the saliva, and other substances with which it comes in contact when in actual use.

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

1. A dental matrix comprising flexible members, means connecting and coöperating with the members to cause the respective member to extend entirely around the inner surface of the tooth against which it bears and approximating the contour thereof, and serving, also, to adjust said members to cause them to bear toward each other to facilitate withdrawal from the teeth substantially as described.

2. A dental matrix comprising flexible members, means connecting and coöperating with the members to cause the respective member to extend entirely around the inner surface of the tooth against which it bears and approximating the contour thereof, and serving, also, to adjust said members to cause them to bear toward each other to facilitate withdrawal from the teeth, additional means carried by the members for placing them under tension, and means operating between the members for effecting additional pressure of a member upon a contacting tooth, substantially as described.

3. A dental matrix comprising members of reverse curvilinear form, means connecting with the members and adapted to cause them to approximate the contour of the portion of the tooth against which each bears, means for effecting tensioning of said members, additional means for effecting separation thereof while tensioned, and means for



effecting displacement of said members to cause them to bear toward each other to facilitate withdrawal from the teeth, substantially as described.

5 4. A dental matrix comprising flexible members, means connecting and cooperating with the members to cause them to approximate the contour of the portion of the tooth against which it bears, and to bear toward  
10 each other to facilitate withdrawal from between the teeth, and a strip or tongue for insertion between the members for effecting separation thereof while bearing against the teeth, substantially as described.

15 5. A dental matrix comprising flexible members carrying means serving to cause the respective members to extend around the inner surface of the tooth against which it bears and approximating the contour thereof, and serving, also, to adjust said members  
20 to cause them to bear toward each other to facilitate withdrawal from between the teeth, and means for varying the bearing-surface of said members for application to different-sized teeth, substantially as described.

25 6. A dental matrix comprising two flexible, oppositely-disposed members adapted to be placed between adjacent teeth, a support constituting a connection between said members  
30 and carrying means for effecting adjustment of the members to cause them to approximate the contour of the inner surfaces of the teeth against which they bear to give the face of the filling therein the general outline of the  
35 tooth and serving also to adjust said members to cause them to bear toward each other and away from the filling to facilitate withdrawal therefrom, substantially as described.

40 7. A dental matrix comprising flexible members adapted to be placed between adjacent teeth and formed, at contiguous ends, with tube-pieces, a distance-adjusting device disposed between the tube-pieces, and means  
45 at the opposite ends of the members for adjusting them to approximate the contour of the tooth and, also, cause them to bear toward

each other to facilitate withdrawal from between the teeth, substantially as described.

8. A dental matrix comprising members of reverse curvilinear form and provided at one  
50 end with a distance-piece, oppositely-threaded nuts secured at the free ends of said members, and an oppositely-threaded screw-bar adapted to engage said nuts to form an adjustable tension-bar for said members, sub-  
55 stantially as described.

9. A dental matrix comprising members of a reverse curvilinear form and adapted to be placed between adjacent teeth, means carried  
60 by the outer ends of the members for effecting tensioning of the same, distance-pieces connecting with the inner ends of the members, one of said distance-pieces being replaceable, the parts being disposed and adapted to cause  
65 the members to bear toward each other to facilitate withdrawal from the teeth, substantially as described.

10. A dental matrix comprising members of reverse curvilinear form and adapted to be placed between adjacent teeth, means con-  
70 necting with the members for tensioning them, said members being provided at contiguous ends with distance-pieces, and a strip or tongue having a pivotal connection with one of said pieces and adapted to extend between  
75 said members, substantially as described.

11. A dental matrix comprising flexible members adapted to be placed between adjacent teeth and formed, at contiguous ends,  
80 with tube-pieces, a distance-adjusting device, disposed between the tube-pieces, a pin adapted to engage the tube-pieces and distance-adjusting device to maintain them in relative position, and means engaging the remaining  
85 ends of said members for placing the same under tension, substantially as described.

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

WILLIAM CRENSHAW.

Witnesses:

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AYLETT T. HOLTZMAN.