No. 758,422. PATENTED APR. 26, 1904.

W. CRENSHAW.

DENTAL MATRIX RETAINER.

APPLICATION FILED APR. 25, 1903.

NO MODEL.

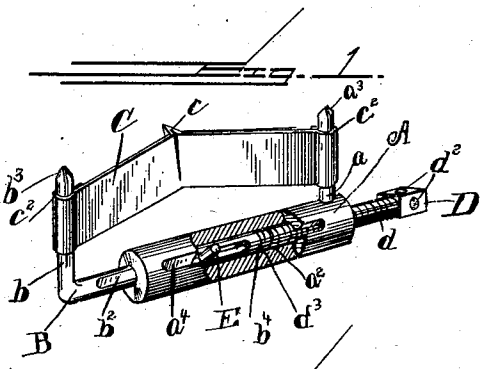


Fig. 1.

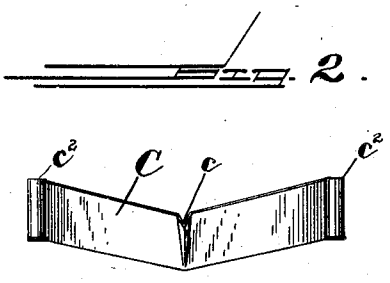


Fig. 2.

Fig. 3.

Fig. 4.

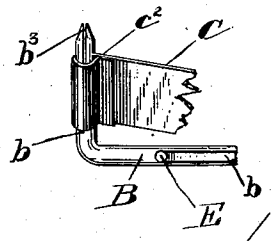


Fig. 5.

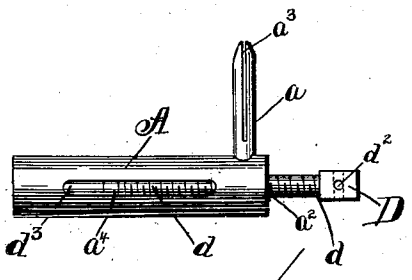
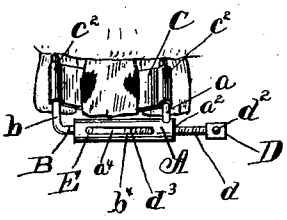


Fig. 6.



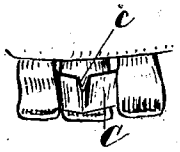
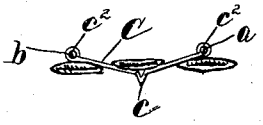


Fig. 7.



WITNESSES

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No. 758,422. Patented April 26, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM CRENSHAW, OF ATLANTA, GEORGIA.

DENTAL-MATRIX RETAINER.

SPECIFICATION forming part of Letters Patent No. 758,422, dated April 26, 1904.

Application filed April 25, 1903. Serial No. 154,283. (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-Matrix Retainers; 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 dental-matrix retainer and aliner for use in dental surgery, which shall in a ready and efficient manner serve to bring a tooth which is to be filled out of alinement and a little forward of the adjacent teeth to facilitate operation thereon and serve as a floor and support while filling cavities in decayed anterior teeth, especialy 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. As cavities of this character are most frequently found in the side of a tooth next an adjacent tooth, a further object is to cause these fillings to take the shape, as nearly as possible, of that portion of the original tooth as is decayed and removed for the purpose of filling.

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

A further object is to produce a dental-matrix-retainer aliner capable of labio-lingual movement which will serve to draw or force a tooth which is in rear of the alinement of the adjacent teeth still farther out of alinement in order to facilitate the filling of a cavity therein, at the same time forcing the adjacent teeth slightly in the opposite direction and forming a floor or backing against which may be built the filling when the cavity in such tooth extends through the lateral wall thereof.

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

The invention consists, further, in the novel construction and combination of parts of a dental-matrix retainer and aliner 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.

Referring to the drawings generally, Figure 1 thereof is a perspective view showing the parts of my improved matrix retainer and aliner assembled and ready for use, the base portion being partly broken away to show the action of the stationary, movable, and actuating members and the slotted portion of the base of the parts of the movable and stationary members and a pin to work therein to retain the transverse arms in relative operative position. Fig. 2 is a front view of the metallic ribbon, showing means for attaching the ends thereof to the transverse arms of the stationary and movable members and also the crimped or **V**-shaped central portion of the ribbon. Fig. 3 shows a detail view of the movable member, illustrating one form of attaching the connecting-ribbon to the transverse arm thereof, the slot in the base portion thereof, and the pin for retaining the same in relative operative position. Fig. 4 shows the stationary member in detail, illustrating the screw-threaded actuating member, the slot in the base portion of the said member, and showing the projecting arm thereof slitted through its longitudinal axis to engage the ribbon without passing the loops thereof over the ends of the transverse arms, both of said projecting arms being so provided with such slits for use on teeth whose size do not permit the loops being used to engage said transverse arms. Fig. 5 is a

front view of three adjacent teeth, showing the central tooth slightly forward of the alinement of the other two, illustrating the method of alining the tooth to be treated, the dark or shaded portion of the central tooth indicating decayed portions in which approximate fillings are to be placed and the pin passed through the slots in the base portions of the stationary and movable members to retain the parts in relative operative position. Fig. 6 shows a rear view of the same teeth and illustrates the crimped or V-shaped central portion of the metallic connecting-ribbon member, which crimped portion is soldered together. Fig. 7 shows a plan view of three teeth in the same relative positions as in Figs. 5 and 6, showing the edge of the ribbon inserted between the teeth and passing behind the central tooth.

Referring to the drawings, the matrix retainer and aliner is usually constructed of five parts, viz:

A stationary member A, comprised of a base portion having a projecting arm a thereon integral therewith and having an opening a^2, adapted to slidably receive the movable member B, and for a portion of said opening being provided on the interior walls thereof with reverse screw-threads, the transverse arm thereof being slitted along its longitudinal axis at a^3 to receive the metallic ribbon-connecting member C, also suitably formed to be engaged by the loops on either end of said member C, and the base portion having a slot a^4, adapted to receive a pin E to pass through it and to engage the corresponding slot in the base portion of the movable member to retain the parts in relative operative position.

A loose member B, having a base portion provided with a projecting arm b, integral therewith, having a slit along and through its longitudinal axis b^3 to receive the ribbon C, the said base portion being suitably formed to slidably engage the base portion of the stationary member A through an opening therein and having a slot b^2 therein to receive a pin passed into it through the slot a^4 to retain the parts in relative operative position. The pin is firmly held at any point in the slot, as by friction, in order to adjust the matrix to any size tooth.

A metallic ribbon-connecting member C, constructed of a thin material having a crimped or V-shaped portion c, the folded or crimped portion thereof being soldered down to withstand the tension or pressure against the under side of the tooth to be operated upon when the ribbon is drawn taut by the action of the screw-threaded member. This said ribbon is designed to fit closely against the under side of the tooth and approximate the contour thereof and has at each end loops c^2, preferably circular in shape, formed by folding the metallic material upon itself and having the ends thereof lapped down upon its body and soldered rigidly thereto to withstand the pressure when the ribbon is tensioned or drawn taut, when the screw-threaded actuating means are applied and pressure put upon the under side of the tooth to be operated upon and upon the outer sides of the two adjacent teeth.

A tensioning or actuating member D, adapted to fit into the base portion of the stationary member, provided with screw-threads d, formed to engage the screw-threads on the interior walls of the opening through said base portion of said stationary member and having at its outer end openings d^2 d^2, into which may be inserted a tensioning pin or lever for applying power for the purpose of forcing said member D at d^3 against the inner end of the base portion of the movable member B at b^4 by means of the screw action, said outer end being so formed that other suitable power may be applied thereto.

A pin E, adapted to be introduced through the slot a^4 into the slot b^2 of the base portions of the stationary and movable members, respectively, to adjustably hold the parts in relative operative position. The pin is securely held, as by frictional engagement with the walls of the slot, so that it may be adjusted to any point in the slot.

In order to place a tension on the member C, the ends thereof, c^2 c^2, respectively, are attached to the upper ends of the transverse arms of the members A and B at a^3 b^3. The screw-threaded end d of the actuating member D is engaged with the screw-threads on the interior walls of the opening in the base portion of the stationary member A, and by turning the same forcing the base portion B of the movable member through the opening a^2 of the base portion of the stationary member A, carrying its transverse arm away from the transverse arm of the stationary member, thus drawing the ribbon C taut.

In the operation of the device the metallic ribbon C is inserted between the teeth on either side of the tooth to be operated upon, so that the crimped or V-shaped portion c thereof is to the rear of the tooth to be operated upon. Suitable power is then applied to the actuating member at d^2, which forces its inner end d^3 to bear directly against the inner end of the loose or movable member B at b^4, thus forcing it along the opening a^2 through the stationary member A. This forcing apart of the members A and B tensions the ribbon C and causes it to bear on the rear of the tooth to be operated upon and by reason of the crimped or V-shaped portion c thereof to assume the approximate contour of such tooth at its lateral and rear sides, and thus form a floor or bearing against which the filling of the tooth may be built.

This tensioning also causes the teeth adjacent to the tooth to be filled to be slightly depressed or pushed back, so that the operation upon the central tooth is facilitated by the same being forced forward of the alinement of the two adjacent teeth. Different-width ribbons may be used for different-length teeth; but the same stationary and movable members and actuating member may be used at all times.

Many advantages are secured by constructing a dental-matrix retainer according to my invention. The device may be quickly and easily arranged to fit or conform to teeth of any size and may be quickly adjusted in position for use. The metal ribbon C extends around the rear and edges of the teeth to be treated, and the crimped or V-shaped portion *c* makes it possible for it to assume the contour of the tooth, and thus when the cavity extends through the lateral sides of the tooth forms a wall against which the filling may be built. The adjustment when effected is rigid and reliable, and after the filling has been effected the device may be readily and quickly removed without causing any injury to the form or outline of the filling. The corresponding slots in the base portions of the stationary and movable members A and B, when the pin is inserted therein, serve to hold the transverse arms parallel, and the tension holds them rigid, so that the whole instrument is held in proper adjustable relative operative position.

The parts are of course constructed, preferably, of non-corrosive metal and should 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 combined dental-matrix retainer and aliner comprising two members, one slidable upon the other, each carrying a projecting arm uninclosed at its upper end and free to receive a flexible member, means for forcing the arms apart, a flexible member attached to the arms, and means for retaining the flexible member in engagement with the arms when they are forced apart, substantially as described.

2. A combined dental matrix, retainer and aliner, comprising two members, one slidable upon the other, each carrying a projecting arm, a flexible member connecting the same and constructed to be attached to said arms and bear against adjacent teeth, means for forcing apart said arms and tensioning said connecting member, and means for maintaining the members against rotation, substantially as described.

3. A dental matrix, retainer and aliner, comprising two members, one slidable within the other, a flexible member, each slidable member carrying a tapered arm slotted along its longitudinal axis to present points of attachment for the flexible member, and means for tensioning said flexible member, substantially as described.

4. A combined dental matrix, retainer and aliner, comprising two members, each carrying a projecting arm and having a slot in its base portion, the slots being constructed to receive a retaining member to hold the members in adjustable operative position, a flexible member connecting said arms and constructed to be attached thereto, and means for tensioning said connecting member, substantially as described.

5. A combined dental matrix, retainer and aliner, comprising two members, one slidable upon the other, each carrying a projecting arm, and one of the members carrying a pin registering and sliding in a slot in the other member, a flexible member connecting said slidable members and constructed to be attached to the arms thereof, and means for tensioning said connecting member, substantially as described.

6. A combined dental matrix, retainer and aliner, comprising two members, one slidable upon the other, each carrying a projecting arm and each having a slot in its base portion, a flexible member connecting said arms, and a member arranged to tension said connecting member, substantially as described.

7. A combined dental matrix, retainer and aliner, comprising two members, each carrying a projecting arm and having a slot in its base portion, a flexible member connecting said arms constructed to be attached thereto, a screw-threaded member constructed to tension said connecting member, means for actuating the same, and a retaining member operating to hold the parts in adjustable operative position, substantially as described.

8. A combined dental matrix, retainer and aliner, comprising two members each carrying a projecting arm and each having a slot in its base portion, a flexible member connecting said arms, constructed to be attached thereto, a screw-threaded member arranged to tension said connecting member, means for actuating said screw-threaded member, and a pin held at any point in the slot in said base portion constructed to hold the parts in adjustable operative position, substantially as described.

9. A combined dental matrix, retainer and aliner, comprising two members each carrying a tapered projecting arm, slotted along its longitudinal axis to receive a connecting member and each having in its base portion a slot constructed to receive a retaining member, a flexible member connecting said arms and constructed with one edge thereof longer than the

other, with a portion of the bearing-face thereof crimped and adapted to approximate the contour of a tooth, and provided with loops on the ends thereof and adapted readily to be attached to and removed from the said arms, a screw-threaded member arranged to tension said connecting member, means for actuating said screw-threaded member, and a pin constructed to retain the parts in adjustable operative position, substantially as described.

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

WILLIAM CRENSHAW.

Witnesses:
C. C. COUSINS,
E. M. SLINEY.