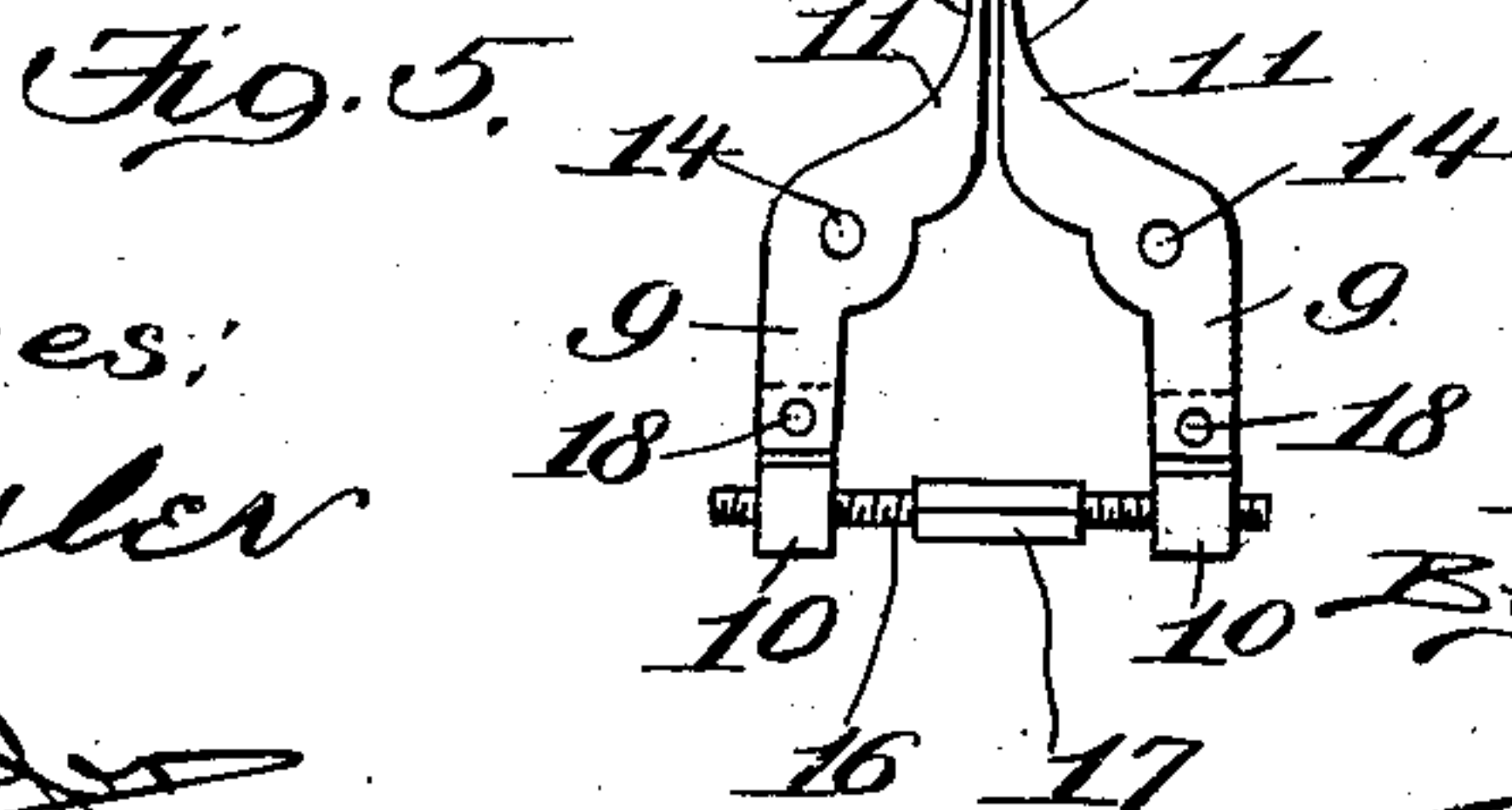
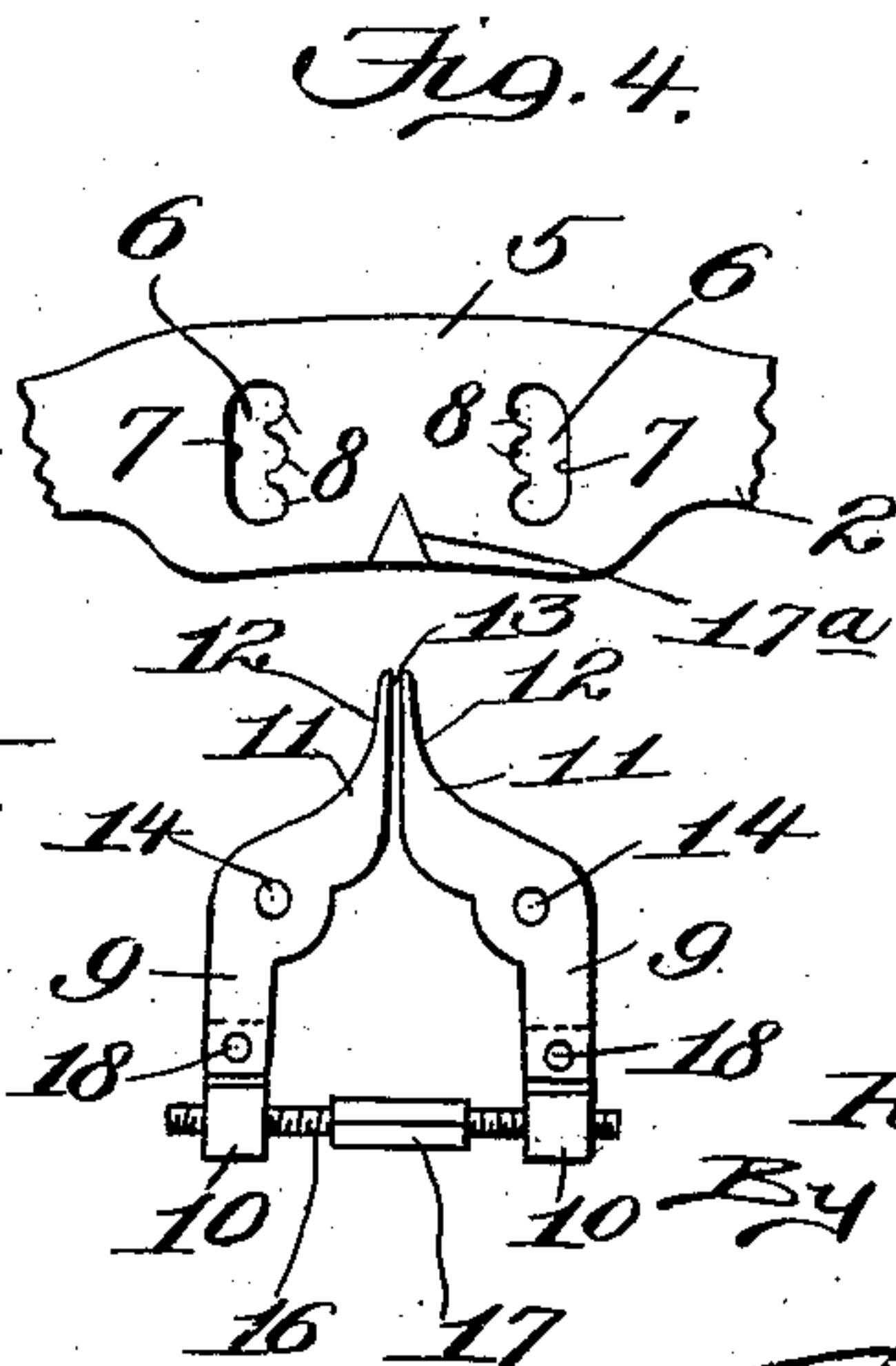
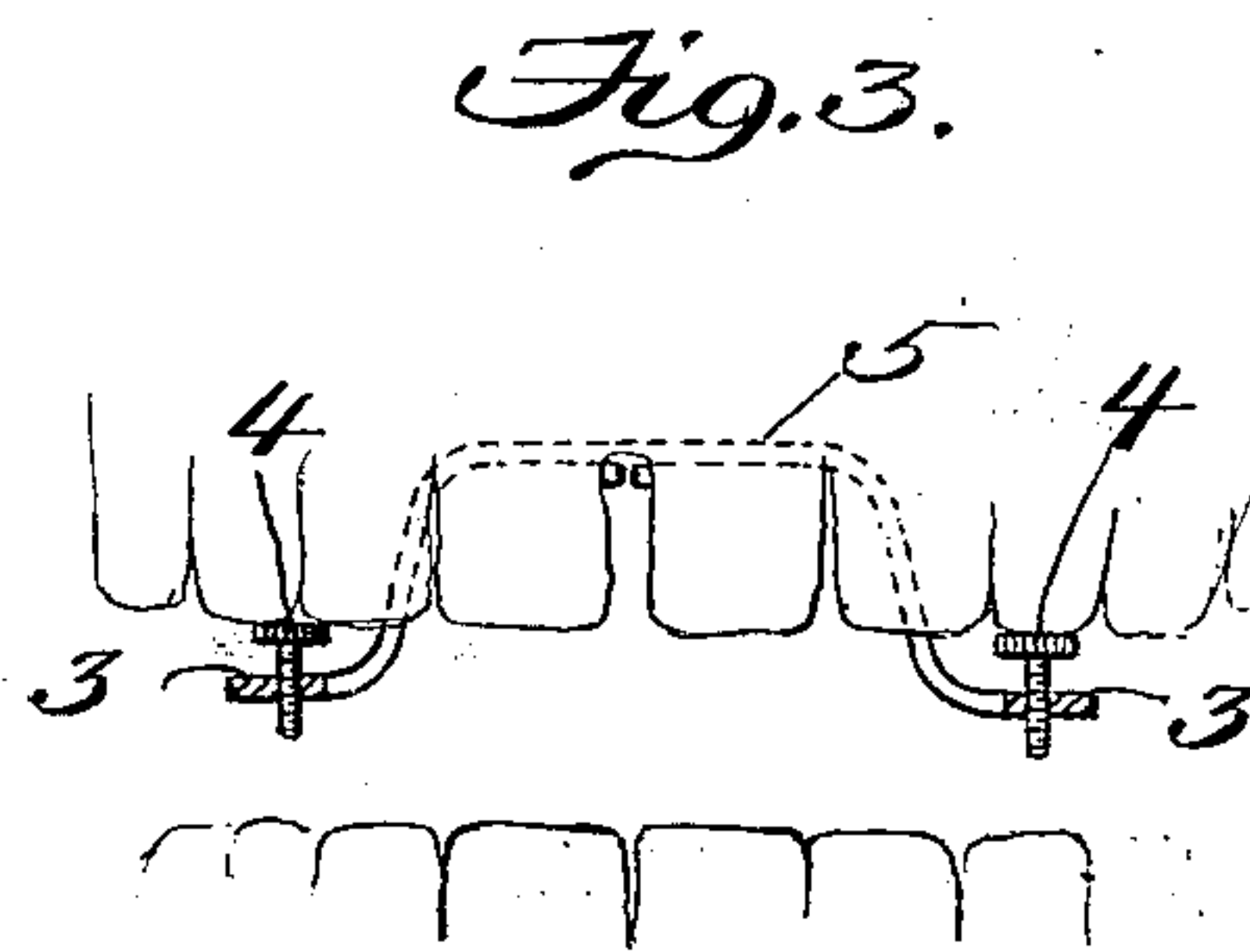
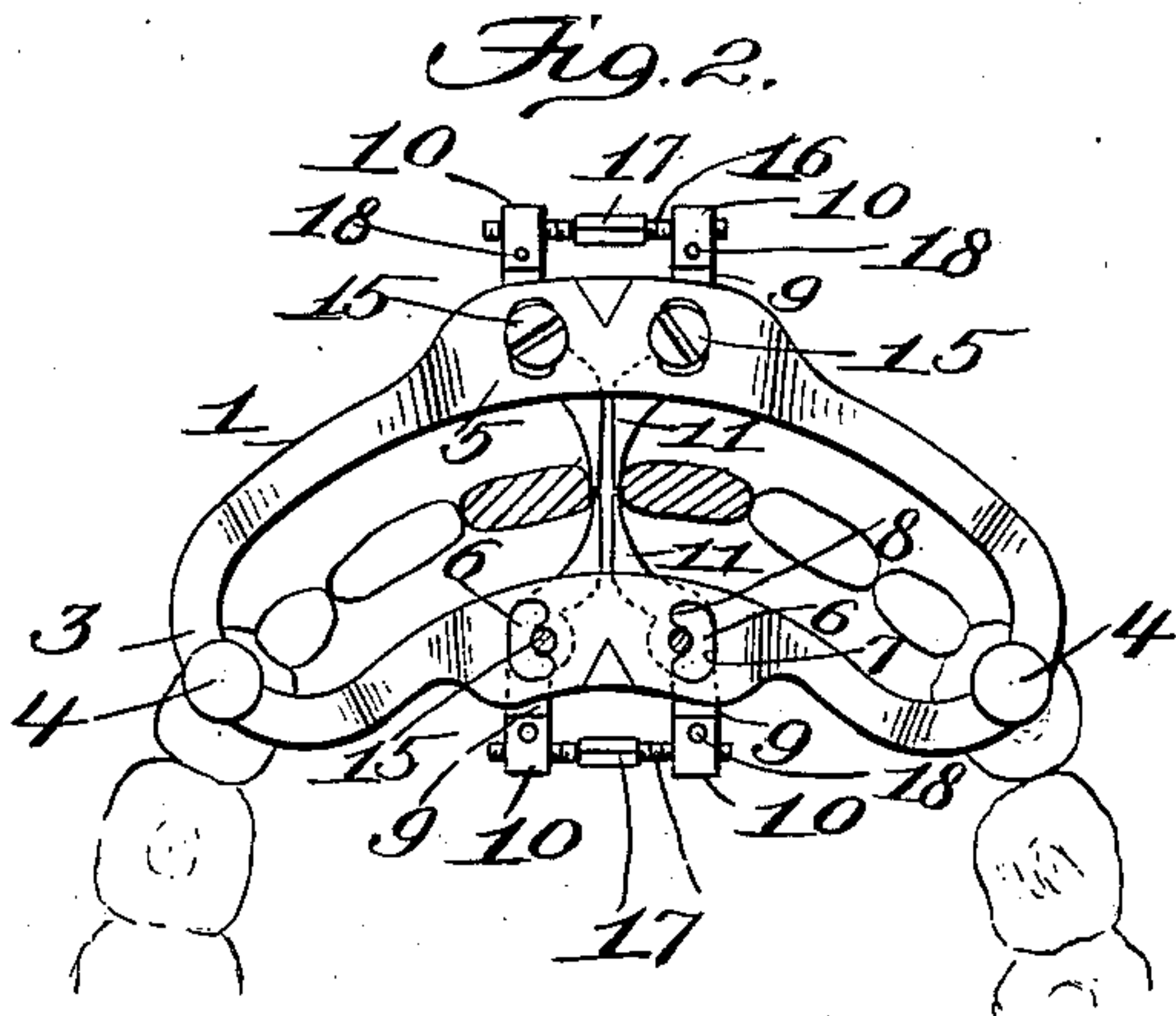
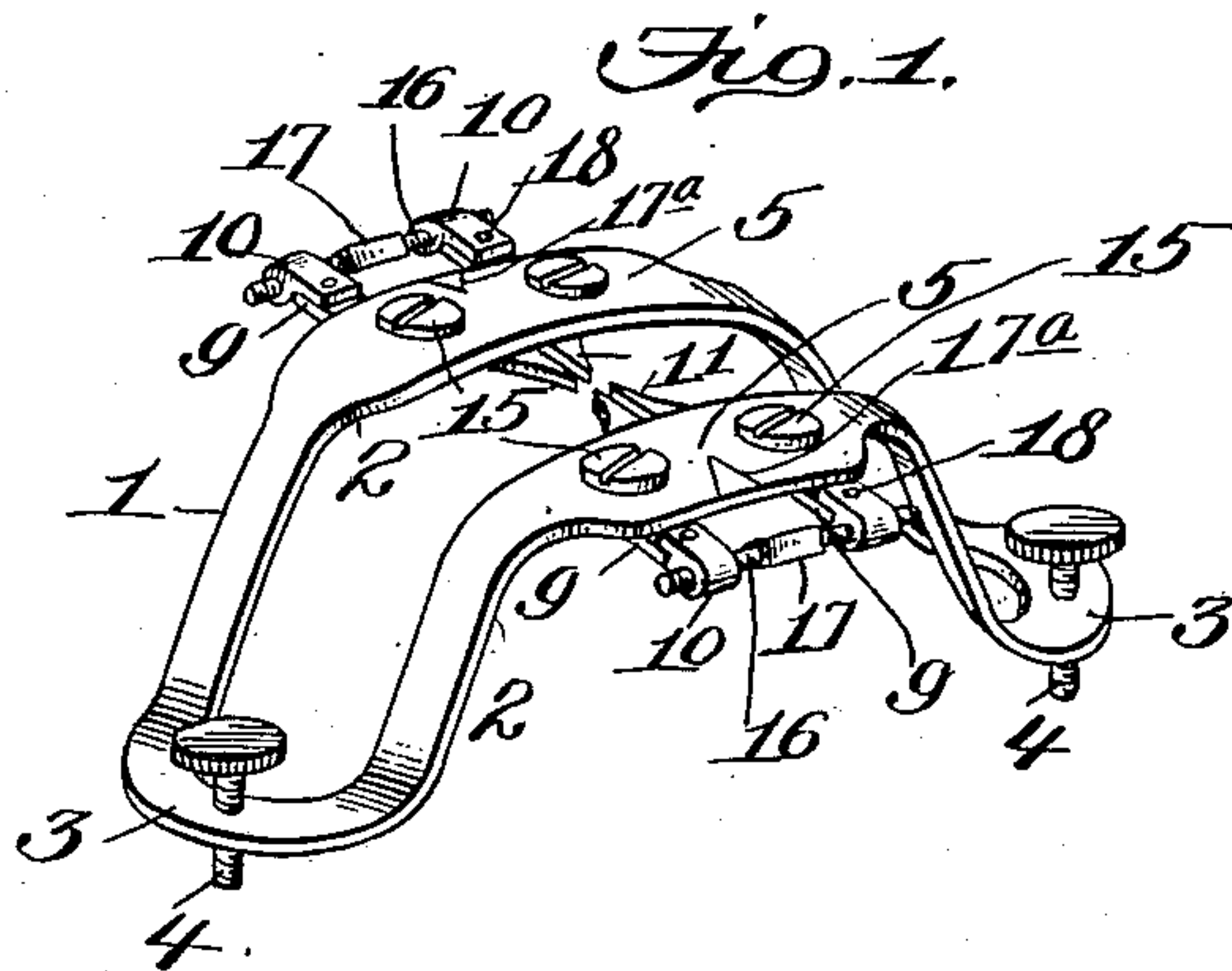


No. 862,694.

PATENTED AUG. 6, 1907.

R. L. ANDERSON.
DENTAL SEPARATOR.
APPLICATION FILED APR. 4, 1907.



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DENTAL SEPARATOR.

No. 862,694.

Specification of Letters Patent.

Patented Aug. 6, 1907.

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To all whom it may concern:

Be it known that I, RUFUS L. ANDERSON, a citizen of the United States, residing at Plant City, in the county of Hillsboro and State of Florida, have invented new and useful Improvements in Dental Separators, of which the following is a specification.

- This invention relates to dental separators adapted for use to separate or force teeth apart to expose cavities for filling or other purposes.

10 The objects of the improved separator are to simplify the construction of devices of this type and provide them with movable means adjustable to any irregularities of the teeth, whether in proper alinement or not, and to produce a separator which is intended to be entirely universal in its adjustment and applicable in any part of the mouth where it is desired to perform the operation of separation.

20 The improved separator consists essentially of a rigid frame shaped to conform to the contour of the jaw and having spreading arms attached thereto and disposed in opposite pairs, the pairs of arms being independently adjustable, and each arm of a pair being individually adjustable to accommodate various applications and render the operation of the separator effective in treating teeth having irregular growth.

25 The invention also consists in the construction and arrangement of the details which will be more fully hereinafter specified.

30 In the drawing, Figure 1 is a perspective view of a separator embodying the features of the invention. Fig. 2 is a plan view of the same shown applied. Fig. 3 is a longitudinal vertical section of the separator shown applied. Figs. 4 and 5 are detail views of parts of the separator.

35 Similar characters of reference are employed to indicate corresponding parts in the several views.

40 The numeral 1 designates a rigid frame longitudinally curved, as shown by Fig. 2, to conform to the shape of the jaws. The frame 1 comprises separated arched supporting members 2 of similar contour and connected by horizontal terminal members 3, having set screws 4 therein, one in each, and operative to maintain the separator in place. Each supporting member 2 is enlarged at its highest central portion, as at 5, and extending transversely thereacross are a pair of slots 6, having outer practically straight walls 7, and inner corrugated walls to provide seats 8, for a purpose which will be presently explained. The enlarged portion 5 of each supporting member 2 has a pair of spreading arms 9 cooperating therewith and applied to the underside of the same. At one extremity, each arm 9 is provided with a screw eye or socket 10, and the opposite end is formed as a spreading terminal 11. The spreading terminal 11 of each arm is projected inwardly and has an outer concave edge 12 and an inner straight edge 13 to reduce the same to a point to facili-

tate the insertion of the spreading terminals of each pair of arms between the teeth. At an intermediate point each arm 9 also has a screw threaded opening 14 to receive a fulcrum screw 15 extending through one of the slots 6 of each supporting member and having heads of such diameter as to prevent accidental separation of the arms from their supporting member. The shank of each fulcrum screw 15 is adapted to engage one of the seats 8 of each slot, as clearly indicated by Fig. 2, and in accordance with the space required between the reduced spreading terminals of the arms. The sockets 10 of each pair of arms 9 are engaged by opposite extremities of a screw adjusting device 16, having an intermediate angular turning member 17, the opposite extremities of this screw device being reversely threaded and operative to draw the outer ends of the arms inwardly towards each other, or force said ends outwardly in reverse directions to regulate the spaced relation of the opposite reduced spreading terminals of the said arms. Furthermore, the adjustment of the screw device 16 of each pair of arms will be effective in maintaining the shanks of the screws 15 in the seats 8 desired to be engaged when the operating terminals of the arms are between the teeth, and spreading tension may be exerted or imposed upon the teeth to any degree desired by adjusting the screw device 16 of each pair of arms. The pairs of arms 9 may be adjusted uniformly, or one pair of arms may be caused to occupy a different relation to the teeth treated than the remaining pair of arms. Furthermore, the two arms of each pair may be adjusted to occupy different positions and bearing relation with respect to the teeth, as, for instance, one arm may have its fulcrum screw engaging the outermost seat 8, and the other arm may have its fulcrum screw bearing in the central or innermost seat in the inner wall of the contiguous slot 6. By this means irregularities in the growth of teeth may be compensated for, and also by having the arms set in pairs on each side of the frame and each pair of arms independently adjustable, a tooth can be rotated, slightly, in its socket to more readily expose a cavity, or for other purposes.

On the supporting members 2 indicators 17^a may be applied of triangular form, with their apices projecting inwardly as a guide for the operator in adjusting the arms, the apex of each indicator 17^a pointing inwardly signifying that the arms will be spread when moved inwardly, and an opposite movement of the arms, or towards the bases of the indicators, will cause the arms to close. This latter operation is due to the connection of the arms by the adjusting screw device 16 when the fulcrum screws 15 are loosened, and to the further fact that the outer terminals of the arms 9 are pivotally connected to the sockets 10, as at 18.

The separator is applied, as shown by Figs. 2 and 3. The arms 9 are removed to bear against the adjacent

side portions of the teeth to be spread and then set by the screws 15 and expanded by the screw devices 16, a suitable wrench means being preferably used to operate said screw devices. The screws 4 are then adjusted in the terminal members 3 of the frame and caused to bear on the teeth of the same jaw. It is well known that, owing to the conical shape of teeth, separators have a tendency to slip toward the roots of the teeth, thereby bruising and injuring the soft tissue.

By the use of set screws to be applied, as shown by Fig. 3, the separator, when in position, will be prevented from slipping towards the gum, the broad bases or heads of the screws being towards the gum to more readily engage and rest upon adjacent teeth. From time to time when required the pairs of arms 9 may be adjusted until a sufficient exposure of the teeth to be treated results, and after the instrument has performed its work to the satisfaction of the operator, it may be removed by releasing the pairs of arms from the teeth that have been engaged.

The improved separator is of such form that it may be applied in any position within the mouth, and particularly in view of the extensive adjustment of the arms 9. It is preferred that the separator be formed entirely of metal of a non-corrosive character, and will be plated to preserve it and to assist in a thorough sterilization thereof after use.

Changes in the proportions, dimensions and minor details may be resorted to without departing from the spirit of the invention.

Having thus described the invention, what is claimed, is:

1. In a dental separator, the combination of an arched loop frame, and opposite pairs of arms, each having attaching means shiftably engaging the frame and adjustable to and from and at an angle to each other.
2. In a dental separator, the combination of an arched loop frame, and opposite pairs of pivoted arms unitedly and individually adjustable, each of said arms having independent shiftably attaching means engaging the frame.
3. In a dental separator, the combination of an arched loop frame, and opposite pairs of arms each having shiftable pivotal connection with the frame, said arms being unitedly and individually movable at an angle with relation to each other.
4. In a dental separator, the combination of an arched loop frame, and opposite pairs of unitedly and individu-

ally adjustable arms having means cooperative therewith for opening and closing the same, each of said arms pivoted separately from the other.

5. In a dental separator, the combination of a supporting frame having openings therein, oppositely disposed pairs of arms, and fulcrum devices carried by each arm for shiftable engagement in the openings to adjustably secure the arms to the frame.

6. In a dental separator, the combination of an arched loop frame, opposite pairs of arms having adjustable connecting devices, and fulcrum devices for each of the arms and shiftable in the frame.

7. In a dental separator, the combination of an arched loop frame, oppositely disposed pairs of arms having adjustable connecting devices pivotally attached thereto, and fulcrums for connecting each of the arms to the frame, said fulcrums shiftable in the frame.

8. In a dental separator, the combination of a supporting frame, opposite pairs of arms movably attached to the frame, and adjustable connecting devices pivotally secured to the arms, said frame having a plurality of fulcrum bearings for the pivotal connections of said devices.

9. A dental separator having oppositely disposed pairs of arms, the arms being movable unitedly towards each other in a straight line or at an angle with relation to each other, and also movable individually at an angle.

10. In a dental separator, a frame having pairs of separating devices movable transversely and at an angle with respect to the frame and adjustable holding devices associated with the frame.

11. In a dental separator, a rigid arched frame having separating devices movably carried thereby, and regulating screws at the ends of the frame to position the same when in operation.

12. A dental separator having an arched loop frame, holding devices carried by the frame, and separating devices each having fulcrums shiftable in the frame.

13. In a dental separator, a frame having opposite supporting members with transverse slots therein, a pair of slots being formed in each member and having the inner walls thereof provided with a plurality of seats, opposite pairs of arms, and fulcrum devices connected to the arms and engaging the slots, said fulcrum arms being adjustable with relation to the several seats in the inner walls of the slots.

14. In a dental separator, the combination of an arched loop frame, oppositely disposed pairs of arms, the arms adjustably connected in pairs, and fulcrums shiftable in the frame for connecting each arm to the latter.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

RUFUS L. ANDERSON.

Witnesses:

MAY E. BURTS,
G. B. WELLS.