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3,056,210

DENTAL FACE BOW AND HINGE AXIS LOCATOR

Filed March 17, 1961

4 Sheets-Sheet 1

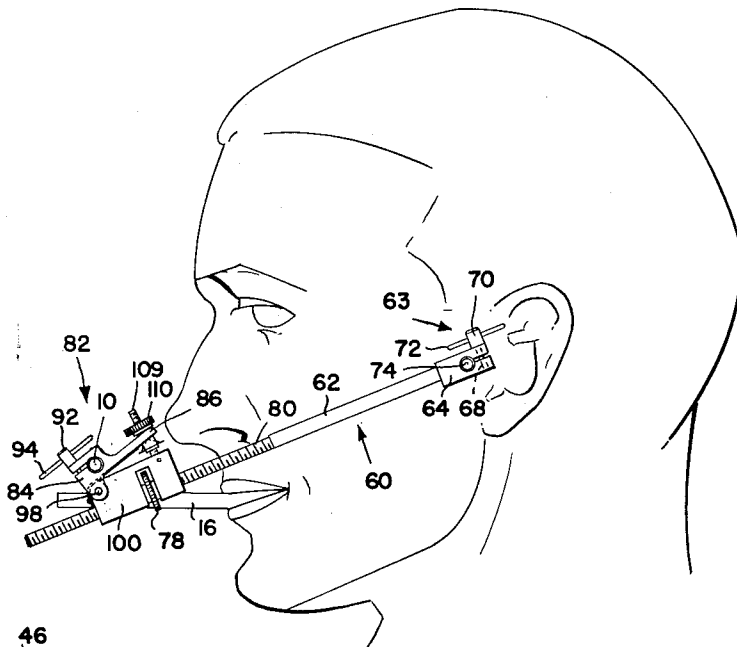


FIG. 1.

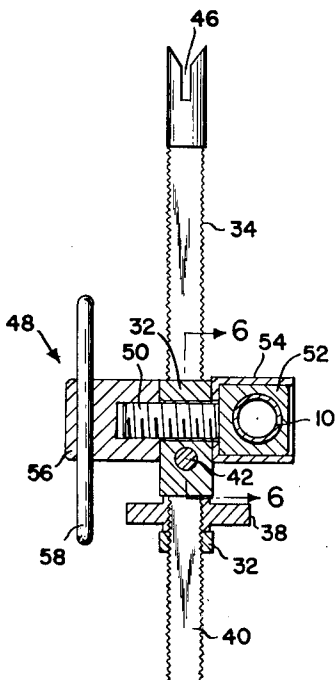


FIG. 4.

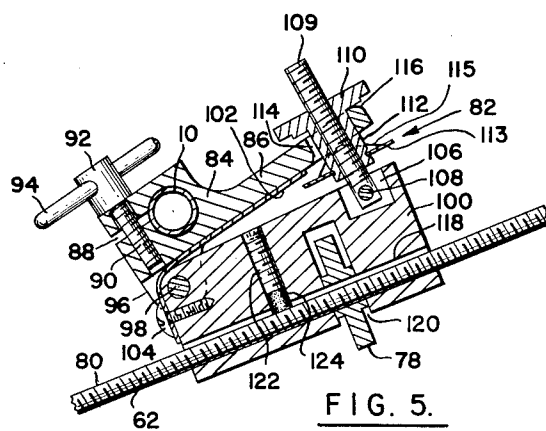


FIG. 5.

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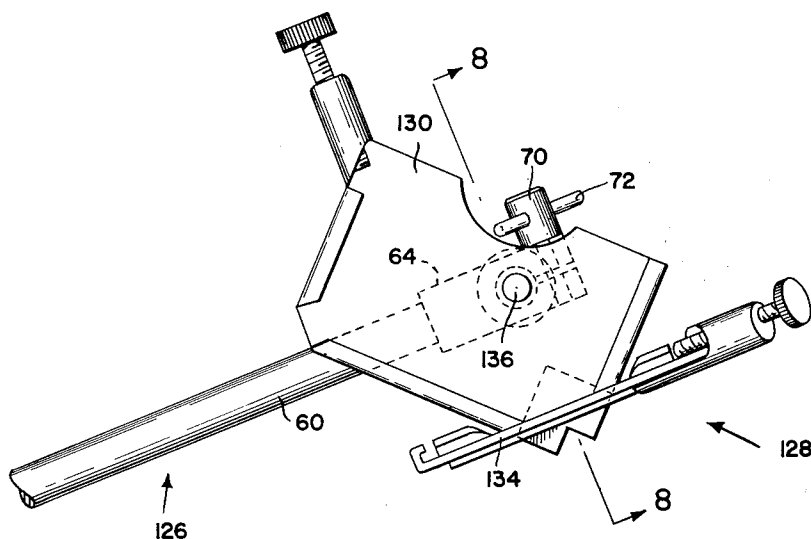


FIG. 7.

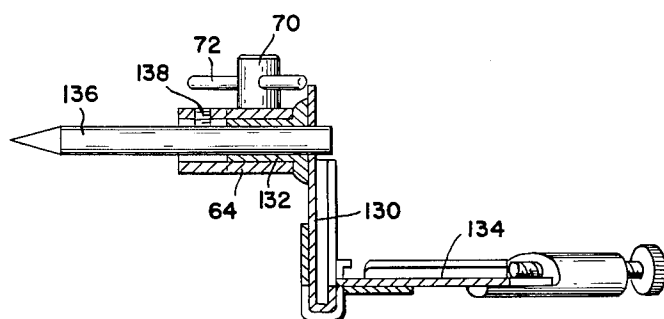


FIG. 8.

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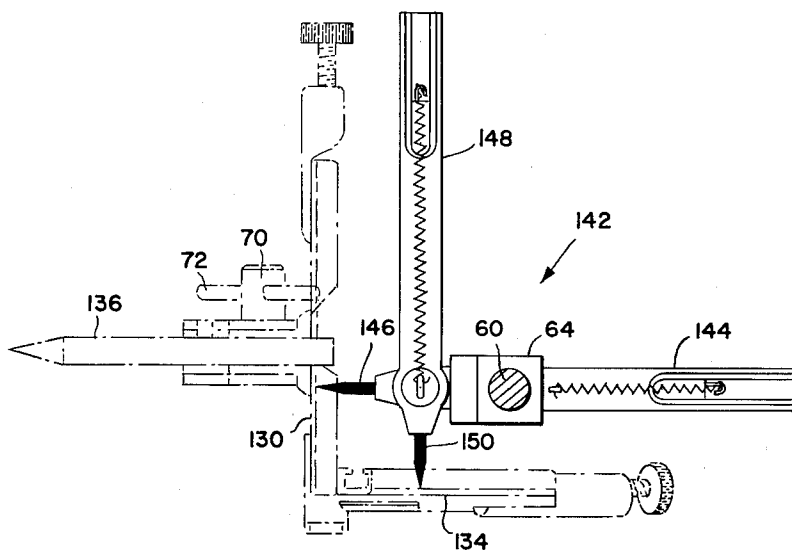
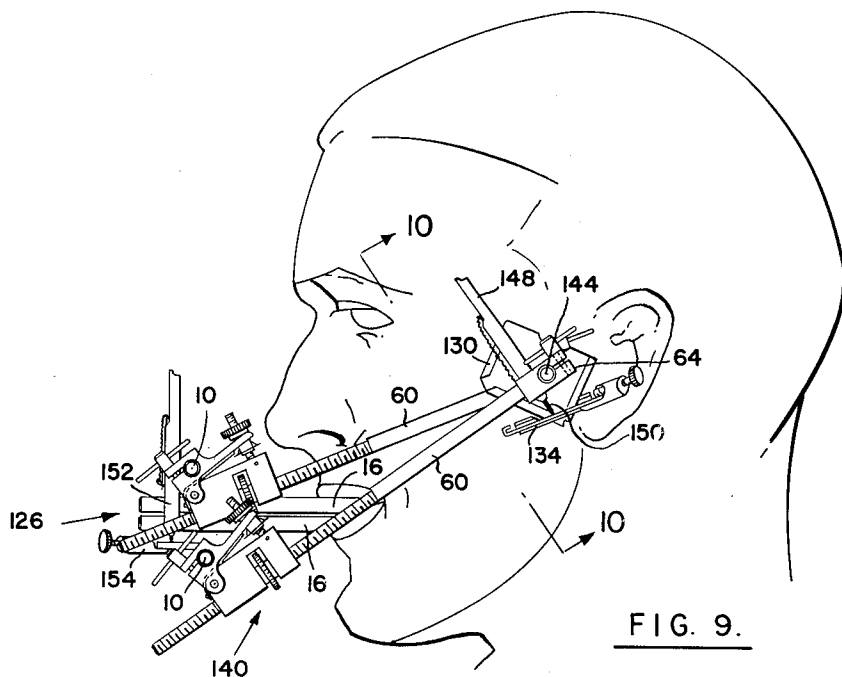
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DENTAL FACE BOW AND HINGE AXIS LOCATOR

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4 Sheets-Sheet 4



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DENTAL FACE BOW AND HINGE AXIS LOCATOR

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8 Claims. (Cl. 33—174)

This invention relates generally to dental apparatus and particularly to an improved dental face bow and hinge axis locator.

Prior instruments for locating the hinge or condyle axis of the lower jaw with respect to the position of a person's teeth commonly are provided with numerous adjustable parts arranged so that not every essential step of the operation of adjusting the instrument can be executed without the danger of disturbing the desired relationship of parts obtained by previously executed steps of the adjusting operation. Accordingly, an object of the invention is to provide a dental face bow with means for facilitating adjustment of the instrument by permitting each essential step of the adjusting operation to be executed independently of the others.

Another object of the invention is to provide such a dental face bow with means whereby a majority of the essential steps of the adjusting operation may be executed with maximum facility.

Another object is to provide such a dental face bow with a condyle locating arm that is exceedingly simple in form.

Other objects and advantages of the invention will become more apparent when the following description is read with reference to the accompanying drawings, in which:

FIGURE 1 is a side view of a dental face bow constructed in accordance with the invention and applied to a patient, part being omitted for the sake of clarity;

FIGURE 2 is a plan view of the instrument;

FIGURE 3 is a front view of the instrument;

FIGURES 4 and 5 are enlarged sections on the planes indicated by lines 4—4 and 5—5 of FIGURE 3;

FIGURE 6 is a section on the plane indicated by line 6—6 of FIGURE 4;

FIGURE 7 is an enlarged fragmentary side view showing the dental face bow fitted with a record holder, as when used in a pantograph arrangement;

FIGURE 8 is a section on line 8—8 of FIGURE 7;

FIGURE 9 is a side view showing a pair of dental face bows in a pantograph arrangement; and

FIGURE 10 is an enlarged section on line 10—10 of FIGURE 9, showing in phantom one face bow fitted with a record holder and in full lines the other face bow fitted with a stylus holder.

The dental face bow constructed in accordance with the invention comprises a horizontally extending tubular crossbar 10. Mounted upon this crossbar is a mouthpiece, generally designated 12, which includes a tray 14 at the end of a horizontally extending bar 16 adjustably affixed to the crossbar 10 by a clamp, generally designated 18. This clamp includes a split part 20 embracing the crossbar 10, a pin 22 extending through the part 20, a sleeve 24 embracing the head of the pin 22 and a nut 26 threaded on the pin 22 and mounting a finger bar 28. A clamp not materially different from the clamp 18 is shown and described in detail in United States Patent No. 1,705,223, issued March 12, 1929.

A support for an axis orbital plane is indicated generally at 30. This support includes a block 32 having freely projected therethrough a vertically extending post 34. One side of the block 32 is provided with a deep recess 36 in which is nested a nut 38 threaded on the post 34. One side of the post 34 is flat, as at 40, and

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threaded into the block 32 is a set screw 42 having interposed between the end thereof and the flat surface 40 a nylon pad 44. The head of the post is slit, as at 46, for receiving the axis orbital plane.

For adjustably mounting the support 30 upon the crossbar 10 a clamp, generally designated 48, is provided. This clamp includes a pin 50 extending freely through the block 32 and provided with a head 52 nested in a cup-like element 54. The crossbar 10 slidably extends through the element 54 and the pin head 52. Threaded upon the opposite end of the pin 50 is a nut 56 mounting a finger bar 58.

Also mounted upon the crossbar 10 are a pair of condyle locating arms, generally designated 60. Each of these arms includes a solid rod 62 having mounted upon one end thereof a clamp, generally designated 63, including a split part 64 secured to the rod 62 by a pin 66. Threaded into the part 64 is a pin 68 having a head 70, which head mounts a finger bar 72. The clamp 63 adjustably holds a condyle pin 74 provided with a point 76. Threaded upon the opposite end of the rod 62 is a nut 78, the threaded portion of the rod being provided with a flat surface 80 upon one side thereof.

The means for connecting a condyle locating arm 60 to the crossbar 10, generally designated 82, comprises a connection part 84 slidably fitted over the crossbar and provided with an arm 86 extending laterally from the crossbar. The part 84 is slit, as at 88, and threaded into the part 84 is a pin 90 having a head 92 and mounting a finger bar 94. Depending from the part 84 are a pair of laterally spaced ears 96, through which ears extends a pin 98.

The pin 98 also extends through a second connection part 100. Overlying one end of the part 100 and extending between the parts 84 and 100 is a leaf spring 102 anchored to the part 100 by means of a screw 104. In the part 100 is a recess 106 across which extends a pivot pin 108. One end of an element 109 is connected to the pin 108. A nut 110 is threaded upon the element 109. A reduced diameter portion 112 of the nut 110 extends freely through an opening 114 in the arm 86. The head of the nut 110 rests upon a rounded terminal portion 116 of the arm 86.

Extending about the portion 112 of the nut 110 is a groove forming a reduced diameter neck, and embracing this neck is a U-shaped element 113. Interposed between the element 113 and the arm 86 is a spring steel washer 115 fitted over the portion 112. The washer 115 is bent as shown and at all times biases the arm 86 against the head of the nut 110.

The part 100 is provided with a through opening 118 and the threaded portion of the rod 62 extends freely through this opening. The part 100 is also provided with a deep recess 120, in which recess is nested the nut 78. Threaded into the part 100 is a set screw 122, and interposed between the end of the set screw and the flat surface 80 is a nylon pad 124.

With the instrument assembled as shown, the tray 14 of the mouthpiece 12 is placed in the patient's mouth and the patient is instructed to close on the tray and hold it firmly between his teeth. Thus the instrument is supported with the bar 16 extending forwardly from the patient's mouth, the crossbar 10 extending horizontally across the patient's face and the condyle arms 60 extending rearwardly from the crossbar 10 respectively along opposite sides of the patient's face, with the condyle pins 74 roughly in the desired positions thereof.

As a first step in the adjustment of the instrument, if a condyle pin 74 is not initially in the desired position thereof, it is moved to such position. The pin 90 is loosened to release the hold of part 84 upon the cross-

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bar 10. Then the condyle arm 60 and the means 82 connecting the condyle arm to the crossbar 10 are turned about the crossbar and shifted axially thereof as a unit. When the condyle arm is in the position desired, the pin 90 is retightened. Now final adjustments are necessary.

The next step in the adjusting operation is to move the condyle pin 74 fore and aft of the patient's face to the final position thereof. To effect this adjustment the nut 78 of the condyle arm 60 is manipulated. The nut cannot move axially, being nested between opposed walls of the recess 120, in consequence of which, when the nut is manipulated, the rod 62 is shifted axially relative to the part 100. The rod 62 moves freely in the opening 118 and is secured against turning about its own axis by the nylon pad 124 bearing upon the flat surface 80.

The next step in the adjusting operation is to move the condyle pin 74 vertically to the final position thereof. To effect this adjustment the nut 110 is manipulated. The leaf spring 102 biases the parts 84 and 100 apart, and the angular distance between these parts is controlled by threading the nut 110 more or less onto the element 109. Increasing the angular distance between the parts 84 and 100 causes the condyle arm to swing downwardly, lowering the condyle pin 74. Decreasing the angular distance between the parts 84 and 100 causes the condyle arm 60 to swing upwardly, raising the condyle pin 74.

When the operator is satisfied that the axes of the condyle pins 74 coincide with the hinge or condyle axis of the lower jaw, tattooing ink is placed upon the point of each pin 74 and the pins are moved into contact with the patient's face so as to tattoo the position of the axes on the face. To move a pin 74 into contact with the patient's face, it is merely necessary to loosen the pin 68 to release the hold of the clamp 63 on the pin 74 and then shift the pin 74 axially as desired.

The support 30 for the axis orbital plane may be moved to any selected position on the crossbar 10 after turning the nut 56 slightly off the pin 50 to release the hold of clamp 48 upon the crossbar 10. After the support 30 is shifted to the desired position, the nut 56 is retightened. The vertical position of post 34 may be varied by manipulating the nut 36. Since this nut is nested between the opposed walls of the recess 36, it cannot move axially, in consequence of which, when it is manipulated, the post 34 is raised or lowered relative to the block 32, depending upon the direction in which the nut 38 is turned. The post 34 moves freely in the opening therefor, designated 125, and is secured against turning about its own axis by the nylon pad 44 bearing upon the flat surface 40.

It should be noted that the condyle locating arm 60 is exceedingly simple in construction, since its principal part is a single length of solid, round stock, instead of a plurality of telescoped tubular sections. It should also be noted that each essential step in the operation of adjusting the instrument may be effected independently of the others. After the condyle arm 60 is turned about and shifted along the crossbar 10 to a desired position, it is clamped there by retightening the pin 90. This adjusted position is not disturbed when the nut 78 or the nut 110 is manipulated to effect further adjustments. In addition, nut 78, controlling the position of the condyle pin 74 fore and aft of the patient's face, and nut 110, controlling the position of the condyle pin 74 vertically, may each be manipulated without disturbing the desired position of parts obtained by manipulating the other. Furthermore, the steps of adjusting a condyle pin 74 vertically and fore and aft of the patient's face are each effected by simple manipulation of a single nut, which materially facilitates adjustment of the instrument since each such adjustment is normally effected by multiple manipulations, e.g., a first manipulation to unclamp the part to be adjusted, a second manipulation to move the part to the desired position, and a third manipulation to clamp the part in the adjusted position.

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Referring particularly to FIGURES 7 to 10, a pair of face bows constructed in accordance with the invention may be arranged for use (in well-known manner) as a pantograph.

Referring particularly to FIGURES 7, 8 and 9, the condyle arm 60 of one face bow, generally designated 126, instead of being fitted with a condyle pin 74, is fitted with a conventional record holder, generally designated 128, including an upright plate 130 having a laterally extending sleeve 132 clamped in the part 64. Facing upwardly and extending outwardly from the plate 130 is a second plate 134. The plates 130 and 134 are adapted for holding records (not shown). Adjustably fitted into the sleeve 132 is a condyle pin 136 held by a set screw 138 threaded into the clamp part 64.

Now referring particularly to FIGURES 9 and 10, the condyle arm 60 of the second face bow, generally designated 140, instead of being fitted with a condyle pin 74, is fitted with a conventional stylus holder, generally designated 142, including a sleeve 144 accommodating a spring loaded stylus 146 and a sleeve 148 accommodating a spring loaded stylus 150. The sleeves 144 and 148 are disposed normal to each other, the sleeve 144 being clamped in the part 64. The styluses 146 and 150 are adapted for working on records held respectively by the plates 130 and 134. It will be understood that supports 30 are removed from the crossbars 10 of the face bows, which extend horizontally across the face of the patient in vertically spaced relation to each other, and that the upper crossbar 10 mounts a pair of conventional styluses 152 adapted for working respectively upon underlying records carried by a pair of conventional holders 154 mounted upon the lower crossbar 10. The two face bows, of course, are not connected together, but are free to be moved relative to each other by the patient.

A pair of face bows constructed in accordance with the invention are inexpensive compared with the cost of conventional pantograph apparatus, in consequence of which if the dentist is able to do without the latter, a great saving is effected. Thus, the fact that a pair of face bows constructed in accordance with the invention may be arranged for use together as a pantograph is of major importance.

It will be understood, of course, that the present invention is susceptible of various modifications which may be made without departing from the general principles of the invention. Accordingly, it is intended to claim the same broadly as well as specifically, as indicated by the appended claims.

What is claimed is:

1. A dental face bow comprising a mouthpiece adapted to be held in and to extend out of a patient's mouth, a crossbar carried by said mouthpiece and adapted to extend horizontally across the patient's face, means for connecting a condyle locating arm to said crossbar including a first part affixed to said crossbar, a part movable about an axis generally parallel to said crossbar, and means for selectively varying the angular distance between said first and movable parts, and a condyle locating arm including an elongated member carried by said movable part and adapted for extending rearwardly therefrom adjacent to one side of the patient's face, said elongated member being freely shiftable axially relative to said movable part, and means operable independently of said angular distance varying means for securing said elongated member in a selected position relative to said movable part.

2. A dental face bow comprising a mouthpiece adapted to be held in and to extend out of a patient's mouth, a crossbar carried by said mouthpiece and adapted to extend horizontally across the patient's face, means for connecting a condyle locating arm to said crossbar including a first part shiftable axially of said crossbar, means releasably fixing said first part to a selected portion of said crossbar, a part movable about an axis generally parallel to said crossbar, and means for selectively varying the angular distance between said first and movable parts, and a

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condyle locating arm including an elongated member carried by said movable part and adapted for extending rearwardly therefrom adjacent to one side of the patient's face, said elongated member being freely shiftable axially relative to said movable part, and means securing said elongated member in a selected position relative to said movable part, said means for fixing said first part to said crossbar, varying said angular distance and securing said elongated member to said movable part being operable independently of each other.

3. A dental face bow comprising a mouthpiece adapted to be held in and to extend out of a patient's mouth, a crossbar carried by said mouthpiece and adapted to extend horizontally across the patient's face, means for connecting a condyle locating arm to said crossbar including a first part affixed to said crossbar, a part carried by said first part and mounted thereon for pivotal movement about an axis generally parallel to said crossbar, and means for selectively varying the angular distance between said first and movable parts, and a condyle locating arm including an elongated member carried by said movable part and adapted for extending rearwardly therefrom adjacent to one side of the patient's face, said elongated member being freely shiftable axially relative to said movable part, and means operable independently of said angular distance varying means for securing said elongated member in a selected position relative to said movable part.

4. A dental face bow comprising a mouthpiece adapted to be held in and to extend out of a patient's mouth, a crossbar carried by said mouthpiece and adapted to extend horizontally across the patient's face, means for connecting a condyle locating arm to said crossbar including a first part affixed to said crossbar, a part movable about an axis generally parallel to said crossbar, biasing means for yieldably increasing the angular distance between said first and movable parts, and means operable against the influence of said biasing means for selectively varying said angular distance, and a condyle locating arm including an elongated member carried by said movable part and adapted for extending rearwardly therefrom adjacent to one side of the patient's face, said elongated member being freely shiftable axially relative to said movable part, and means operable independently of said angular distance varying means for securing said elongated member in a selected position relative to said movable part.

5. A dental face bow comprising a mouthpiece adapted to be held in and to extend out of a patient's mouth, a crossbar carried by said mouthpiece and adapted to extend horizontally across the patient's face, means for connecting a condyle locating arm to said crossbar including a first part affixed to said crossbar, a part movable about an axis generally parallel to said crossbar, and means for selectively varying the angular distance between said first and movable parts, and a condyle locating arm including an elongated member carried by said movable part and adapted for extending rearwardly therefrom adjacent to one side of the patient's face, said elongated member being freely shiftable axially relative to said movable part, and means operable independently of said angular distance varying means for shifting said elongated member axially and holding the same in a selected position relative to said movable part.

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6. A dental face bow comprising a mouthpiece adapted to be held in and to extend out of a patient's mouth, a crossbar carried by said mouthpiece and adapted to extend horizontally across the patient's face, means for connecting a condyle locating arm to said crossbar including a first part affixed to said crossbar, a part movable about an axis generally parallel to said crossbar, and means for selectively varying the angular distance between said fixed and movable parts, and a condyle locating arm including an elongated member carried by said movable part and adapted for extending rearwardly therefrom adjacent to one side of the patient's face, said elongated member being freely shiftable axially relative to said movable part, and means threaded upon said elongated member for co-action with said movable part to hold said elongated member in a selected position relative to said movable part and operable independently of said angular distance varying means for shifting said elongated member axially relative to said movable part.

7. A dental face bow comprising a mouthpiece adapted to be held in and to extend out of a patient's mouth, a crossbar carried by said mouthpiece and adapted to extend horizontally across the patient's face, means for connecting a condyle locating arm to said crossbar including a first part affixed to said crossbar, a part movable about an axis generally parallel to said crossbar, and means for selectively varying the angular distance between said first and movable parts, and a condyle locating arm including a rod extending freely through said movable part and adapted for extending rearwardly therefrom adjacent to one side of the patient's face, and an element threaded upon said rod and nested between opposed walls of a recess formed in said movable part, being secured by said opposed walls against moving axially relative to said movable part, and being operable independently of said angular distance varying means for shifting said rod axially relative to said movable part.

8. A dental face bow comprising a mouthpiece adapted to be held in and to extend out of a patient's mouth, a crossbar carried by said mouthpiece and adapted to extend horizontally across the patient's face, means for connecting a condyle locating arm to said crossbar including a first part affixed to said crossbar, a part movable about an axis generally parallel to said crossbar, and means for selectively varying the angular distance between said first and movable parts, a condyle locating arm including a rod extending freely through said movable part and adapted for extending rearwardly therefrom adjacent to one side of the patient's face, and an element threaded upon said rod and nested between opposed walls of a recess formed in said movable part, being thereby secured against moving axially relative to said movable part, and being operable independently of said angular distance varying means for shifting said rod axially relative to said movable part, and coaxing means on said movable part and rod securing said rod against movement about its longitudinal axis.

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