

May 10, 1932.

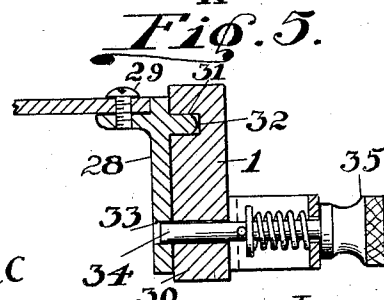
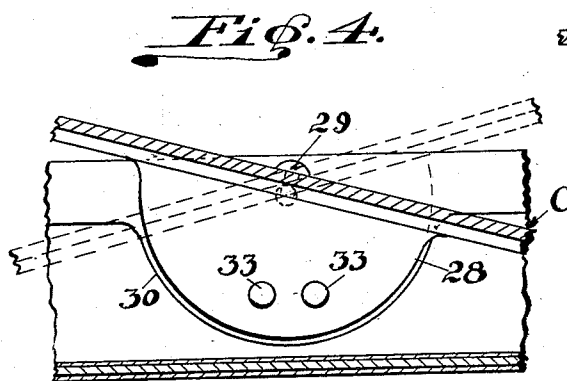
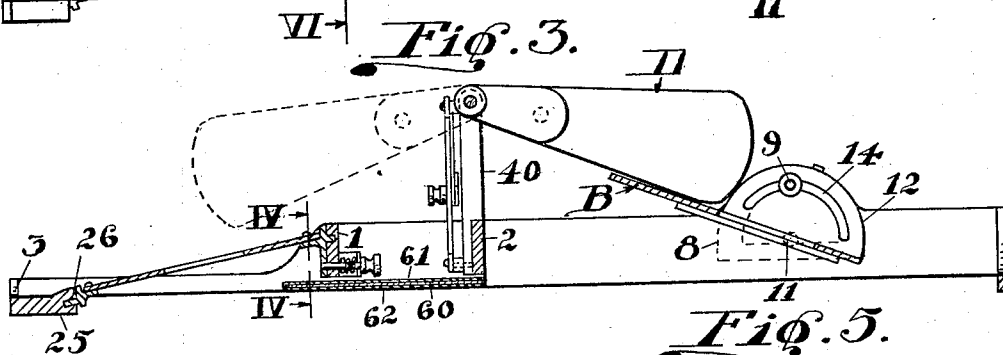
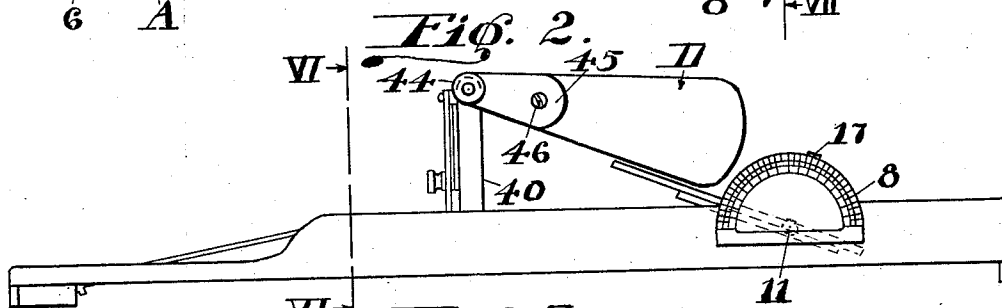
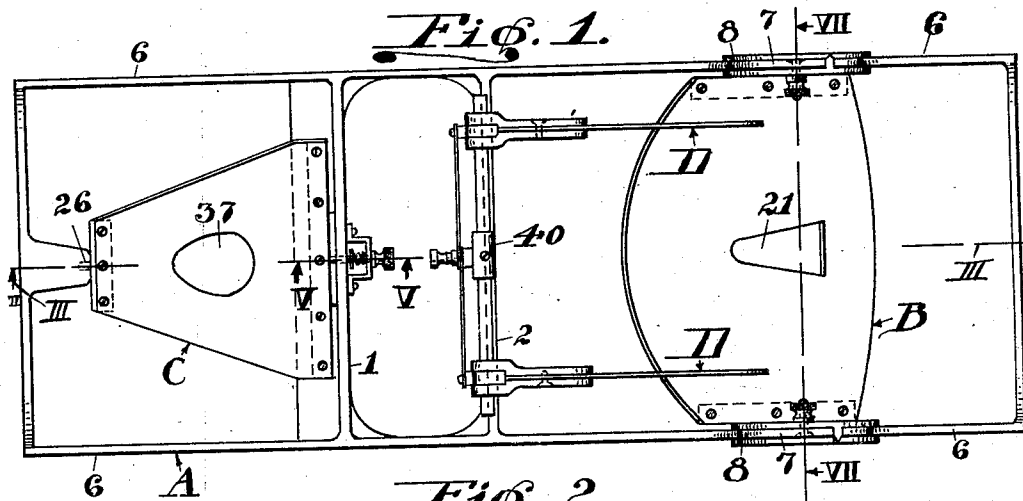
D. M. GHRIST

1,857,503

COMBINED SINUS AND MASTOID HEADREST

Filed July 30, 1928

3 Sheets-Sheet 1



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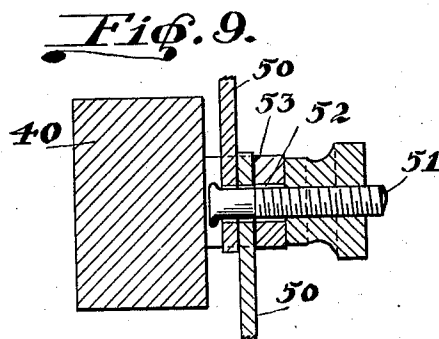
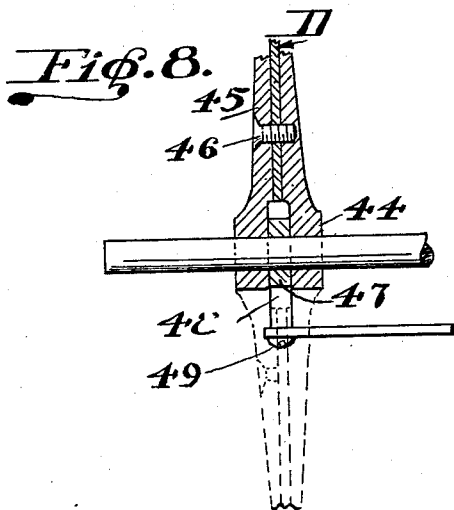
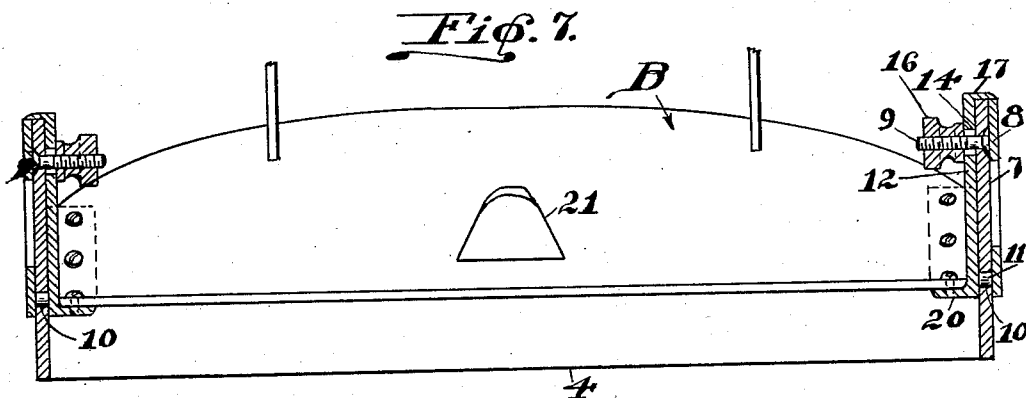
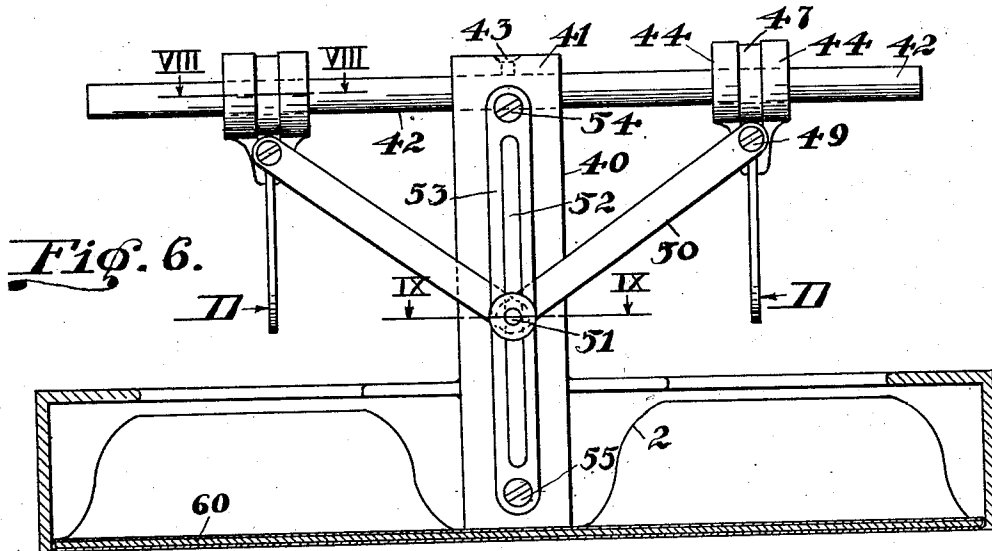
D. M. GHRIST

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COMBINED SINUS AND MASTOID HEADREST

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3 Sheets-Sheet 2



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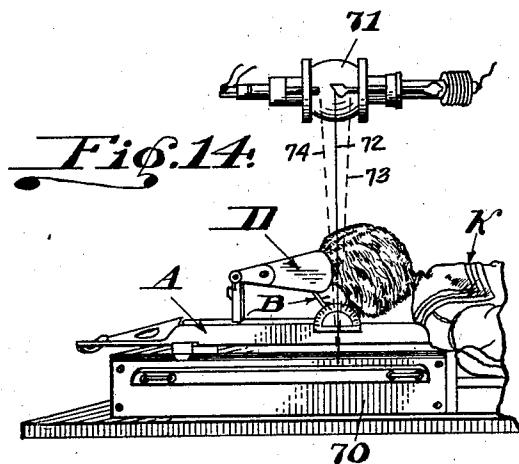
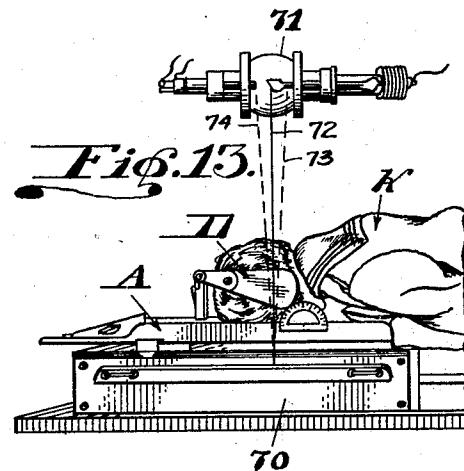
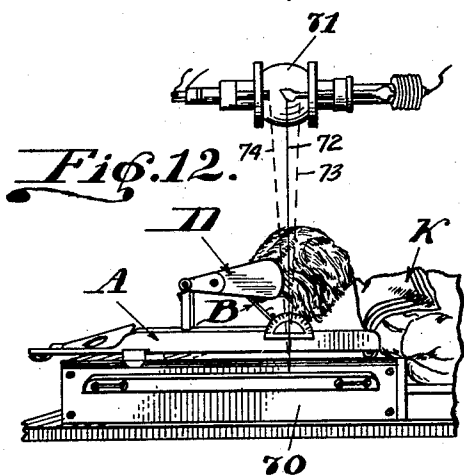
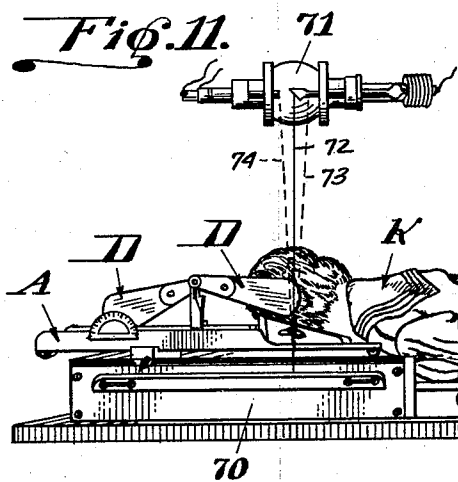
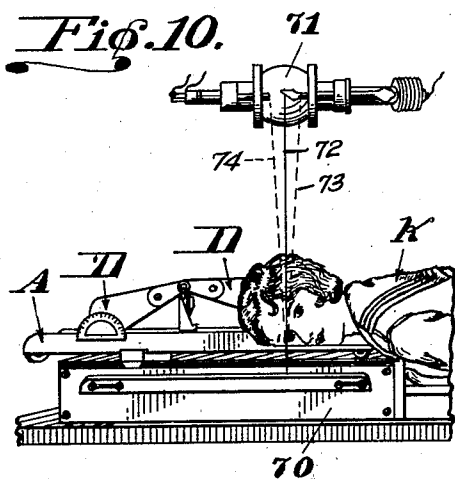
D. M. GHRIST

1,857,503

COMBINED SINUS AND MASTOID HEADREST

Filed July 30, 1928

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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COMBINED SINUS AND MASTOID HEADREST

Application filed July 30, 1928. Serial No. 296,265.

This invention relates to a head rest and clamp for use in connection with X-ray apparatus to obtain Roentgenograms.

An object of this invention is to provide a head rest and clamp of such a character as to make it particularly adaptable for use in conjunction with or without a Buckey-Potter diaphragm of either the flat or curved type, and also to provide such a construction where-
 10 by the device may be fitted and affixed to such diaphragms and X-ray tables of various sizes.

Another object is to provide a head positioning device for use in conjunction with an X-ray apparatus to obtain comparative stereoplates or films showing the sphenoid cells, ethmoids and frontal sinuses, as well as the antrums and mastoids for use in the diagnosis of disease.

Another object is to provide such a device having means for holding the head of the patient in various fixed positions.

Another object is to provide such a device with precision means for adjusting the position of the head of the patient.

Another object is to provide a head positioning device characterized by having precision for use in conjunction with an X-ray apparatus with or without a Buckey-Potter diaphragm whereby substantially identical Roentgenograms of the same person may be reproduced at different times for purposes of identification.

Another object is to provide such a device that is readily applied to the head of the patient and operates to hold the head comfortably in a fixed position.

A further object resides in the provision of such a device which is simple in construction, adaptable to many uses, and operated with facility.

The foregoing objects, together with such other objects and advantages as may appear, constitute some of the major features of my invention, which briefly stated, may be said to reside in the provision of a frame, adapted for use in conjunction with an X-ray apparatus with or without a Buckey-Potter diaphragm, which frame comprises adjustable head supporting panels for use in supporting

the head in variously disposed positions, together with a cooperative head clamp adapted to clamp the head in variously disposed positions on said panels. The invention further resides in the parts and arrangement of parts, one embodiment of which is fully shown now in example in the accompanying drawings, in which:

Fig. 1 is a top plan view of the device;

Fig. 2 is a side elevation of the same;

Fig. 3 is a vertical section on line III—III of Fig. 1;

Fig. 4 is an enlarged fragmentary section on line IV—IV of Fig. 3;

Fig. 5 is an enlarged fragmentary section on line V—V of Fig. 1;

Fig. 6 is an enlarged sectional view on line VI—VI of Fig. 2;

Fig. 7 is an enlarged sectional view on line VII—VII of Fig. 1;

Fig. 8 is an enlarged fragmentary section on line VIII—VIII of Fig. 6;

Fig. 9 is an enlarged fragmentary sectional view on line IX—IX of Fig. 6;

Fig. 10 shows the setting of the device as employed on a patient to obtain stereo-Roentgenograms of the right mastoid;

Fig. 11 shows the same for the left mastoid;

Fig. 12 shows the setting for obtaining Roentgenograms of the frontals, ethmoids and antrums; this setting is also used for fractures of the face;

Fig. 13 shows the setting for "Granger's G line";

Fig. 14 shows the setting for sphenoid cells in the open mouth.

Referring to the drawings more specifically, for a detailed description and particularly to Fig. 1, the device is seen to consist of a panel B, preferably of bake-lite a second panel C, preferably of bake-lite, and head clamping blades D, also of bake-lite together with means for coordinating these elements into an efficacious device to function as hereinbefore set forth.

The base line 4 of the frame A, which is best shown in Fig. 7 may be either curved or flat to fit either a curved or flat Buckey-Potter diaphragm, or a flat table surface. In

this instance, it is shown as flat. To mount the panel B, which may be of any suitable material pervious to X-rays, which in this instance is bakelite, the side members 6 of the frame A are equipped near one end with upstanding arcuate projections 7 to the outside of which are suitably attached protractors 8. The arcuate projections 7 are provided near their peripheries with a screw threaded stud 9 rigidly attached thereto. They are also provided with holes 10, located at the center of the arc, which are adapted to rotatably hold the pins 11 of the members 12. The member 12 is adapted to be pivotally supported on pins 11 and is formed in an arc of the same radius as the arcuate projections 7. The purpose of this structure is to provide a means of clamping the member 12 in fixed positions. Near the periphery of the member 12, there is provided an arcuate slot 14, which is adapted to slidably receive the screw threaded stud 9. As a means of clamping the members 12 to the arcuate projections 7, a nut 16 is screwed down on the screw threaded stud 9. To provide for arcuate measuring of the angular displacement of the panel B, relative to the frame A, there is formed a finger 17 upon the member 12, which is adapted to ride over the top of the arcuate projection 7 and slidably engage the protractors 8. It is understood that this structure is duplicated at each side of the frame and the panel B is mounted between the members 12 in the following manner:

A flange 20 is provided at the lower edge of each member 12 which is designed to support the end of the panel B suitably secured thereto. For purposes of accurately locating the head of a patient on the panel, there is formed in the panel B, an aperture 21 suitably designed to receive the nose of the patient.

The foregoing arrangement of parts provides a structure whereby the panel B may be placed at various angles with precision and held immovable in each position.

At the opposite end of the frame A, the panel C, which in this case is bakelite, is mounted in the following manner; The end cross member 3 of the frame A is equipped with an extension 25 intermediate of the side members 6 upon which one end of the panel C is rotatably mounted as shown at 26 with the other end suitably attached to an arcuate plate 28 as shown at 29. As a companion mounting for the plate 28, a cross member 1 of the frame A is provided with an arcuate depending portion 30, corresponding with said arcuate plate. The arcuate plate 28 is equipped with a projecting pin 31 which is rotatably held in a hole 32 in the cross member 1, while the lower portion of said plate 28 has a plurality of holes 33 adapted to receive a spring impelled pin 34, which is suitably mounted on the opposite side of the

arcuate depending portion 30 and provided with a head 35, adapted to be grasped by the fingers. By predeterminedly locating holes 33 with precision, the panel C may be fixed at a desired angle with facility and accuracy; the panel C being thus adapted to be positioned at either of opposite transverse inclinations, as shown in Fig. 4. The panel C is also inclined to the horizontal in the direction of its length with its inner end uppermost which when the panel is tilted laterally disposes it at an inclination both transversely and longitudinally. The panel C has an aperture 37 near the central portion, designed to allow the ear of the patient to pass through and thereby position the head.

The tilting and inclined arrangement of the panel C provided in the foregoing paragraph is designed to compensate for the shape of the head and to bring the mastoids directly in line with the X-ray tube target when either the right or left side of the head is on the panel.

As a means of maintaining the head in a fixed position, the device is equipped with a head clamping arrangement, which consists of the hereinbefore mentioned blades D suitably mounted upon the frame A. The blades D with the special mounting, I have furnished, are adapted to be used in conjunction with either the panel B or panel C, and may be made of any suitable material that is not impervious to X-rays, in this case bakelite is used.

The ensuing paragraph deals with the mounting for the blades D.

On the cross member 2 of the frame A, an upstanding post 40 is formed integral with said member 2, and provided near the top portion thereof with a hole 41 adapted to receive a shaft 42. The shaft 42 is held immovable in said hole 41 by means of a set screw 43. Slidably and rotatably mounted upon said shaft 42 are companion collars 44 which have extending arm portions 45 adapted to receive the panel D therebetween and be clamped together by means of a screw 46. Also slidably mounted on the shaft 42 between the companion collars 44 is another collar 47 having a projection 48 provided with a screw threaded hole adapted to receive and hold the screw 49. The screw 49 pivotally retains the end of a link 50. The opposite end of the link 50 is pivotally held by a screw 51 which screw extends through a slot 52 in the bar 53, the bar 53, in turn being securely mounted on the post 40 as shown at 54 and 55 and spaced away from said post to allow the links to slide therebetween, as best shown in Fig. 9. The screw 51 is provided with a nut adapted to be turned by the fingers and serves as a means for clamping the links 50 in any immovable position. It is manifest that by moving the screw 51 up or down in the slot 52, that the collar 47 is moved out-

wardly and inwardly respectively, on the shaft 42 and that with the arrangement as set forth, the blades D are likewise moved. In order to provide a clamping mechanism that will exert a pressure and still not injure the head of the patient, I have incorporated into the combination a flexibility of the blades D, which makes it possible to hold the head of a patient substantially immovable without causing any unnecessary discomfort or bruises to the patient. It is also obvious, with the arrangement of parts as described, that the blades D may be rotated upon the shaft 42 either together or individually and used either in conjunction with panel B or panel C, thus providing a device for uses which has not heretofore been possible.

In connection with producing stereo-Roentgenograms, there is provided a lead plate 60 adapted to cover substantially one-half of the sensitized plate or film upon which the picture is to be produced. This, in effect, allows an exposure to be made on one-half of a sensitized plate.

The lead plate 60 is preferably of thin construction and consequently has no rigidity. To overcome this, there is incorporated in the frame A, thin sheets 61 and 62 of metal, preferably aluminum, extending between the side members 6 and spaced apart to receive the lead sheet 60 therebetween.

The stereo effect in the Roentgenograms is obtained by the following steps:

The patient's head is first positioned on the panels; the position depending on the Roentgenogram desired. In Fig. 10 for instance, the setting is for the right mastoid. After the head has been positioned on the panel and the cassette containing a sensitized film placed under the diaphragm with one-half of said film protected by the lead plate, the X-ray tube is then moved until the line 72 coincides with the dotted line 73 at which point an exposure is made. The exposed plate or film is then removed and marked as "Plate No. 1, right mastoid stereo No. 1, right shift". Another cassette is then introduced under the diaphragm, one-half being protected by the lead plate 60 and the X-ray tube is then moved until the line 72 coincides with the dotted line 74. This film is then exposed with the patient's head in the same fixed position. This plate is marked "Plate No. 2, right mastoid stereo No. 2, left shift".

The patient's head is then reversed and the opposite flexible blade D is brought to bear against the back of the head. This serves to position the head on the left side in precisely the same position that it occupied when on its right side. The unexposed portion of plate No. 1 is then placed under the diaphragm with the exposed part under the lead plate. The X-ray tube is moved until line 72 coincides with line 74 and an exposure made. This exposure is marked "Left mas-

toid stereo No. 1, left shift". Plate No. 2 is likewise treated with the X-ray tube moved so that line 72 coincides with dotted line 73 and is then marked "Left mastoid stereo No. 2, right shift". These plates are then used in conjunction with an X-ray stereo-scope for reading. The same stereoscopic principle is employed in obtaining stereo-Roentgenograms of frontals, ethmoids, antrums and sphenoids.

The foregoing description deals with the parts and arrangement of parts. The closely following description will deal with the application of the device to bring out the major features thereof, in operation.

In Fig. 10, the device is shown in conjunction with a Buckey-Potter diaphragm 70 and an X-ray apparatus 71. The head of the patient K is shown as set for an exposure of the right mastoid. In this instance, the right ear of the patient is inserted into the aperture 37 of the panel C and only the blade D that presses against the back of the head is used, the other blade D being thrown over to the other side out of the way. In Fig. 11, the left ear of the patient has been inserted into the aperture 37 and the setting is consequently for an exposure of the left mastoid. In Fig. 12, the setting is for an exposure of the frontals, ethmoids, and antrums. In this case, the device is reversed from the position shown in Figs. 10 and 11 and the nose of the patient K is inserted into the aperture 21 of the panel B. The blades D are brought to bear upon the sides of the head and exert a pressure that stabilizes the head in a fixed position. The panel B is seen to be tipped at a considerable angle to the horizontal which angle is readily and accurately shown by the finger 17 on the protractor 8. This setting may also be used in determining fractures of the face. Fig. 13 shows the setting for an exposure of "Granger's G line". In this instance, the panel B is tipped in the opposite direction from that shown in Fig. 12, or seventeen and one-half degrees below the horizontal and the angle of tipping is also shown on the protractor 8. In Fig. 14, the setting is for an exposure of the sphenoid cells in the open mouth, with the panel B in an extreme angle to the horizontal or approximately fifty-five degrees.

The foregoing description serves to bring out the salient features of my invention. I am aware, however, that my device may be modified and refined without departing from the scope of the specification nor the meaning of the appended claims. I therefore reserve the right to such variations.

I claim:

1. In a head rest, a frame, a panel mounted upon said frame adapted to support the head of a person in a sideways position, means for rotating, within limits, said panel transversely of said frame, and means for

holding the head of the person in a substantially fixed position on said panel.

2. In a head rest, a frame, a panel mounted upon said frame and adapted to support the head of a person in a sideways position, means for rotating, within limits, said panel transversely of said frame, means for locking said panel in a plurality of predetermined points of rotation, and means for holding the head of the person in a substantially fixed position on said panel.

3. In a head rest comprising a frame, a panel mounted transversely of said frame adapted to support the head of a person face downward, a second panel mounted longitudinally of said frame and adapted to support the head of a person in a sideways position, and means mounted on said frame adapted to cooperate with either of said panels, for holding the head of a person in a substantially fixed position.

4. In a head rest comprising a frame, a panel mounted transversely of said frame adapted to support the head of a person face downward, a second panel mounted longitudinally of said frame and adapted to support the head of a person in a sideways position, and means mounted on said frame adapted to cooperate with either of said panels, for holding the head of a person in a substantially fixed position, said means consisting of resilient blades operable to exert a clamping action upon the head of the person.

5. In a head rest comprising a frame, a panel mounted transversely of said frame adapted to support the head of a person face downward, a second panel mounted longitudinally of said frame and adapted to support the head of a person in a sideways position, and means mounted on said frame adapted to cooperate with either of said panels, for holding the head of a person in a substantially fixed position, said means consisting of resilient blades pivotally mounted at a point intermediate of said panels and adapted to rotate from the first mentioned panel to the said second panel, and operable to exert a clamping action upon the head of the person supported upon either of said panels.

6. In a head rest comprising a frame, a panel mounted transversely of said frame adapted to support the head of a person face downward, a second panel mounted longitudinally of said frame and adapted to support the head of a person in a sideways position, and means mounted on said frame adapted to cooperate with either of said panels, for holding the head of a person in a substantially fixed position, said means consisting of resilient blades pivotally mounted at a point intermediate of said panels and adapted to rotate from the first mentioned panel to the said second panel, and means

for moving said blades relative to each other to increase or decrease the space therebetween.

7. In a head rest comprising a frame adapted to support the head of a person face downward, a panel pivotally mounted transversely of said frame and provided with an aperture adapted to receive and position the nose of the person, a second panel adapted to support the head of a person in a sideways position, pivotally mounted longitudinally of said frame and provided with an aperture to receive and position the ear of the person, and means pivotally mounted intermediate of said panels adapted to cooperate with either of said panels to hold the head of the person in a substantially fixed position.

8. In combination with an X-ray apparatus, a frame, means upon said frame for receiving the head of a person face downward, means upon said frame for receiving the head of a person sideways, and cooperative means upon said frame for holding the head of the person in a substantially fixed position upon the above mentioned means.

9. In a head rest, a frame, a panel, a pivotal connection between said panel and said frame on which said panel may be turned longitudinally of said frame, said panel having a facial member receiving opening and adapted to support the head of a person face downward, a protractor on said frame arranged concentric with the pivotal connection between said panel and frame, said pivotal connection including a member on said panel, means carried on said frame engageable with said member for holding said panel at various positions on said frame, a finger on said member for cooperating with said protractor to designate the angular position of said panel, and means carried by said frame for clamping the head of the person in a substantially rigid position on said panel.

10. In a head rest, a frame, a panel inclined in the direction of its length, a pivotal connection between said panel and frame on which said panel may be tilted transversely to said frame into oppositely inclined positions, and releasable means for holding said panel against movement relatively to its transversely tilted positions.

In testimony whereof, I have affixed my signature.

DAVID M. GHRIST.