Sept. 6, 1955 J. E. DELK, SR 2,717,314

DEVICE FOR SUPPORTING THE HEAD, AND HOLDING IT STATIONARY WHILE MAKING X-RAY PICTURES

Filed Jan. 23, 1952 2 Sheets-Sheet 1

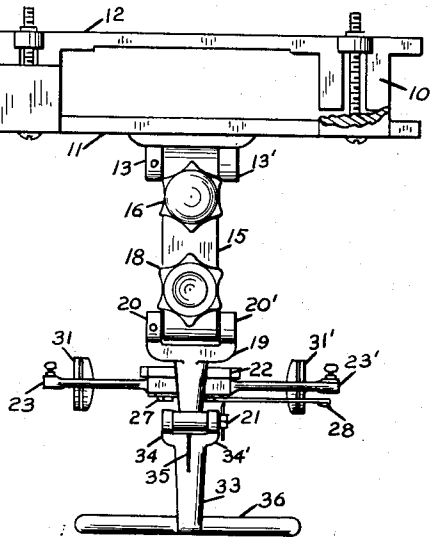


Fig 1

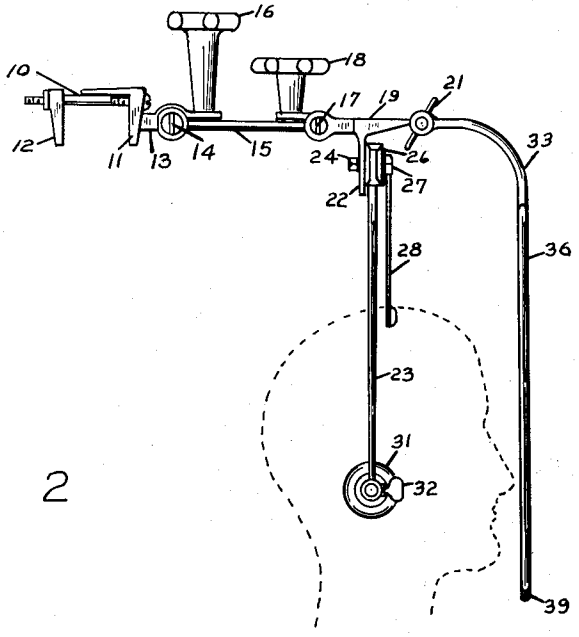


Fig 2

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DEVICE FOR SUPPORTING THE HEAD, AND HOLDING IT STATIONARY WHILE MAKING X-RAY PICTURES

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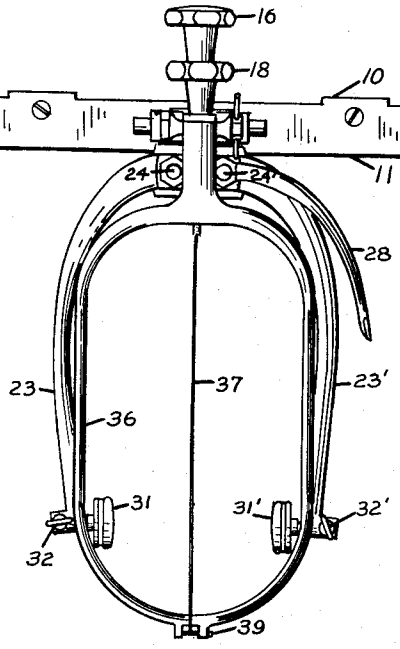


Fig 3

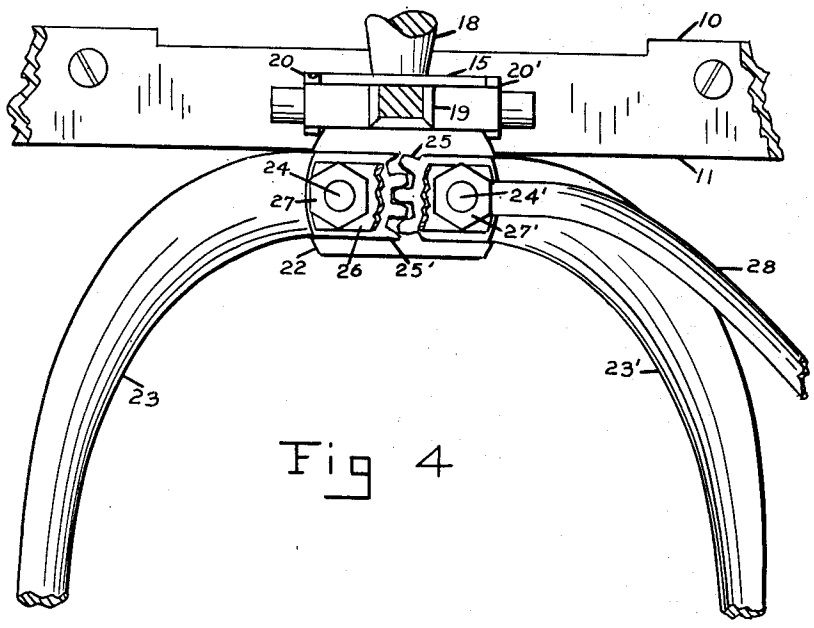


Fig 4

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DEVICE FOR SUPPORTING THE HEAD, AND HOLDING IT STATIONARY WHILE MAKING X-RAY PICTURES

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Application January 23, 1952, Serial No. 267,857

11 Claims. (Cl. 250—50)

My invention relates to equipment for roentgenography and more specifically to a device for supporting the head and holding it stationary in proper position while making X-ray pictures.

Because of the complex bony structure of the human head, roentgenography of the head requires painstaking and accurate technique. Many times, overlying and confusing shadows occur in a roentgenogram because of the inexact positioning of the head to give an erroneous and illegible picture, thus necessitating additional roentgenographs which are expensive and time consuming.

In roentgenography, the X-rays must traverse a definite course through predetermined entrance and exit points on the head; therefore, it is necessary, not only to manipulate the head, but also to adjust the X-ray tube and film-cassette to the head in reference to distance and angle. These adjustments and manipulations may be done manually, by observation without mechanical assistance, but the results so obtained are sometimes unsatisfactory.

Accordingly, it is an object of my invention to provide a device which will properly position the head of a person to be roentgenographed.

A further object of my invention is to provide a device as described above which may be adapted to standard X-ray equipment quickly and efficiently.

A further object of my invention is to provide a device as described above which is adjustable to any size head.

A further object of my invention is to provide a device as described above which is inexpensive to manufacture and durable in structure.

A further object of my invention is to provide a device as described above which is easily and efficiently operated when installed on X-ray equipment.

Other and further objects and advantages of my invention will be apparent from the following disclosure when taken in conjunction with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Fig. 1 is a top plan view of a device embodying my invention.

Fig. 2 is a side view of the device shown in Fig. 1.

Fig. 3 is a front view of the embodiment shown in Fig. 1.

Fig. 4 is an enlarged fragmentary view of a detail.

Referring now in detail to the embodiment chosen for purposes of illustration, numeral **10** denotes generally a support clamp having jaws **11** anl **12**. Jaw **11** is a substantially flat, rectangular member which acts to support the remaining structure. As seen in Figs. 1 and 2, jaws **11** and **12** are coupled by conventional bolts and nuts so that these jaws may clamp onto the top portion of an upright film-cassette. Spaced ears **13** and **13'** protrude outwardly from the front side of jaw **11** and retain a pivot pin **14** fixed therebetween.

Pivotally mounted on pin **14** is bracket **15**. As seen in Fig. 2, one end of bracket **15** is curved around pin **14** and is releasably held by lock bolt **16** which threadably engages the adjacent body portion of bracket **15**. When

lock bolt **16** is tightened, bracket **15** will no longer rotate. Similarly, the other end of bracket **15** is arranged to rotatably support pivot pin **17** and is provided with lock bolt **18** which is similar to lock bolt **16** for locking pin **17** against rotation when tightened.

A frame supporting member **19**, having spaced arms **20**, **20'** at one end similar to ears **13** and **13'**, is fixed by those arms to the free ends of pivot pin **17** which protrude outwardly from bracket **15**. Therefore, by tightening lock bolt **18**, rotation of member **19** with respect to bracket **15** may be stopped. Member **19** normally extends horizontally from bracket **15**; and, as seen in Fig. 1 this member tapers toward its free end. On this free end is formed a transverse journal for lock screw **21**, whose function will be described in more detail hereinafter.

Depending from member **19** is a substantially rectangular plate **22** which is integral with member **19** at right angles thereto. Plate **22** is normally parallel to jaw **11** and also forms a bearing plate for alignment arms **23** and **23'**. As seen in Fig. 4, arms **23** and **23'** are pivotally mounted on studs **24** and **24'** respectively, which extend forwardly through spaced parallel holes in the plate **22**. In addition, the portion of arms **23** and **23'** between studs **24** and **24'** are machined to form gear teeth **25** and **25'** which engage each other so that upon rotation of one arm about its respective bolt, the other arm will rotate accordingly. A positioning plate **26** of smaller size than plate **22** and having holes matching with those of plate **22** is positioned over the engaged portions of arms **23** and **23'** so that studs **24** and **24'** extend through the holes provided in plate **22** therefor. Nuts **27** and **27'** threadably engage studs **24** and **24'**, respectively, and thus retain plate **26** and arms **23** and **23'** in place. Nut **27'** is provided with a nut actuating arm **28** integral therewith which extends parallel to arm **23'** so that by pivoting this arm, nut **27'** may be tightened or loosened to provide a means whereby arm **23'** binds on plate **22** thereby locking this arm with respect to the plate. It is to be remembered that arms **23** and **23'** are geared together so that by locking one arm, both arms are thereby locked. Nut **27** is firmly screwed down on stud **24** but is not tightened sufficiently to prevent movement of arm **23**.

Arms **23** and **23'** extend outwardly and downwardly as shown in Figs. 3 and 4 and their free ends are provided respectively with head rest pads **31** and **31'** which are swivelly mounted in ordinary manner by means of thumb screws **32**, **32'**. Arms **23** and **23'** are of such a size and shape that when pads **31** and **31'** rest against opposite sides of a human head, the arms tend to encompass the top portion of the head.

Referring now to frame supporting member **19** mentioned above, brace **33** is pivotally mounted thereon by means of adjusting screw **21** as shown in Fig. 1. It will be noted that, ears **34** and **34'** are similar to arms **20** and **20'** and are formed to extend over the ends of the transverse journal in member **19** so that set screw **21** may pass through a hole in ear **34'** and through the journal in member **19** threadably engage ear **34**. Adjusting screw **21** is of such length that when it is screwed into ear **34**, the head engages ear **34'** to close the space between ears **34** and **34'** and allow them to bind on the end portions of the journal in member **19**. As illustrated in Fig. 1, a slot **35** is provided in brace **33** so that the space between ears **34** and **34'** may be closed as described above.

Brace **33**, as illustrated in Fig. 2, curves downwardly to form a 90 degree elbow, and rigidly affixed to its lower end is a somewhat elliptically shaped alignment frame **36**, being larger than a man's head and being normally positioned so that it may be pivoted into spaced relation, parallel to arms **23** and **23'**. As seen in Fig. 3, an alignment cross-hair or wire **37** is attached

to the top of frame 36 by screw 38 and this wire 37 extends down to the lower central outside portion of ring 36 and is adjustably attached thereto by a positioning screw 39 which is journaled for rotation parallel to the lower central portion of frame 36 as shown in Fig. 1. Wire 37 is wound around screw 39 in the threads thereof so that by rotating the screw, slight adjustment may be had for the lateral positioning of wire 37.

It is apparent from the foregoing description that, when my invention is clamped onto the top portion of a film-cassette and that cassette is in an upright position at the proper height to roentgenograph a seated person's head, arms 23 and 23' are so fixed to the remaining structure of my invention that head pads 31 and 31' are always equidistant in perpendicular planes from the film-cassette. Also, it will be obvious that head pads 31 and 31' will also be equidistant from the perpendicular plane of wire 37 with respect to the film-cassette even though arms 23 and 23' may be rotated as described above. Minor adjustments to insure that these pads remain equidistant from the perpendicular plane of wire 37 may be made by adjusting thumb screws 32, 32'.

In use, locking bolts 16 and 18 are loosened to allow arms 23, 23', and therefore head pads 31, 31', to be positioned properly in front of the film-cassette. Then bolts 16 and 18 are tightened, thus locking frame supporting member 19 in position, with arms 20, 20' parallel to the film-cassette. Now, by moving nut actuating arm 28, nut 27' may be loosened, thus allowing arms 20, 20' to be rotated away from each other so that a person can be seated in front of the film-cassette. The arms are then closed slowly until the person's head is gently held between pads 31 and 31'. Lock screw 21 may then be loosened and frame 36 brought down close to the head. The nose of the person may then be accurately aligned with wire 37 before nut actuating arm 28 is again tightened. As soon as the head of a person is properly aligned and the pressure against pads 31 and 31' so adjusted that it will hold a person's head in straight alignment, frame 38 may be rotated away from the head and out of the line of X-ray projection.

It is to be remembered that the X-ray projector must also be aligned with wire 37, which, in turn, aligns the head of the person with the projector. After adjustments mentioned above are made, and after frame 38 is rotated up and away from the head, an X-ray picture may be taken.

It will be obvious to those skilled in the art that many variations may be made in the embodiment chosen for illustration without departing from the scope of my invention as defined by the following claims.

I claim:

1. A device for supporting a human head while making X-ray pictures comprising means for engaging the film-cassette of an X-ray apparatus for mounting said device on said film-cassette, supporting means associated with said means, opposed spaced alignment arms pivotally mounted on said supporting means, means connected to said arms to provide opposed rotation of said arms, an alignment wire adjacent said supporting means in a plane midway between said arms for aligning the nose of a person whose head is engaged by said arms, and means for supporting said alignment wire.

2. A device for supporting a human head while making X-ray pictures comprising means for engaging the film-cassette of an X-ray apparatus for mounting said device on said film-cassette, a frame supporting member mounted on said means, opposed spaced alignment arms rotatably mounted on said frame supporting member, said arms being provided with gear teeth which respectively engage each other, an alignment wire mounted on said frame supporting member in a plane midway between said arms for aligning the nose of a person whose head is engaged by said arms, and means for supporting said wire.

3. A device for supporting a human head while making X-ray pictures comprising means for engaging the film-cassette of an X-ray apparatus for mounting said device on said film-cassette, a bracket pivotally mounted on said means, a frame supporting member fixed to said bracket, a depending bearing plate fixed to said frame supporting member, opposed spaced alignment arms rotatably mounted on said bearing plate, said arms being provided with gear teeth which respectively engage each other, head pads respectively attached to the free ends of said alignment arms, and an alignment means pivotally mounted on said frame supporting member in a plane midway between said head pads for aligning the nose of a person whose head is engaged by said head pads.

4. A device for supporting a human head while making X-ray pictures comprising a clamp having jaws for engaging the film-cassette of an X-ray apparatus for mounting said device on said film-cassette, a frame supporting member adjustably fixed to said clamp, mounting studs on said frame supporting member, opposed spaced alignment arms rotatably mounted on said mounting studs, said arms being provided with gear teeth which respectively engage each other, nuts threadably engaging said mounting studs, a nut actuating arm attached to one of said nuts whereby said arm may be actuated to tighten said nut to stop rotation of both said alignment arms, head pads respectively attached to the free ends of said alignment arms, a frame pivotally mounted on said frame supporting member, and an alignment means carried by said frame in a plane midway between said head pads for aligning the nose of a person whose head is engaged by said head pads.

5. A device for supporting a human head while making X-ray pictures comprising a clamp for engaging the film-cassette of an X-ray apparatus for mounting said device on said film-cassette, a frame supporting member adjustably fixed to said clamp, a depending bearing plate fixed to said frame supporting member, mounting studs on said bearing plate, opposed spaced alignment arms rotatably mounted on said mounting studs, said arms being provided with gear teeth which respectively engage each other, nuts threadably engaging said mounting studs, a nut actuating arm attached to one of said nuts whereby said arm may be actuated to tighten said nut to stop rotation of both said alignment arms, head pads respectively attached to the free ends of said alignment arms, a frame pivotally mounted on said frame supporting member, and an alignment means carried by said frame in a plane midway between said head pads for aligning the nose of a person whose head is engaged by said head pads.

6. A device for supporting a human head while making X-ray pictures comprising a clamp for engaging the film-cassette of an X-ray apparatus for mounting said device on said film-cassette, a bracket pivotally mounted on said clamp, a frame supporting member pivotally mounted on said bracket, a depending bearing plate fixed to said frame supporting member, opposed spaced alignment arms rotatably mounted on said bearing plate, said arms being provided with gear teeth which respectively engage each other, means operatively connected to said arms for stopping rotation of both said alignment arms, head pads respectively attached to the free ends of said alignment arms, a frame pivotally mounted on said frame supporting member, and an alignment means carried by said frame in a plane midway between said head pads for aligning the nose of a person whose head is engaged by said head pads.

7. A device for supporting a human head while making X-ray pictures comprising a clamp for engaging the film-cassette of an X-ray apparatus for mounting said device on said film-cassette, a pivot pin fixed to said

clamp, a bracket pivotally mounted on said pivot pin, a second pivot pin journaled for rotation in said bracket, a frame supporting member fixed to said second pivot pin, a depending bearing plate fixed to said frame supporting member, opposed spaced alignment arms rotatably mounted on said frame supporting member, said arms being provided with gear teeth which respectively engage each other, means connected to said arms for stopping rotation of both said alignment arms, head pads respectively attached to the free ends of said alignment arms, a frame pivotally mounted on said frame supporting member, an alignment wire carried by said frame in a plane midway between said head pads for aligning the nose of a person whose head is engaged by said head pads, and means for supporting said wire.

8. A device for supporting a human head while making X-ray pictures comprising a clamp of engaging the film-cassette of an X-ray apparatus for mounting said device on said film-cassette, a pivot pin fixed to said clamp, a bracket pivotally mounted on said pivot pin, a locking bolt for tightening said bracket on said pivot pin whereby pivotal motion of said bracket may be stopped, a second pivot pin journaled for rotation in said bracket, a second locking bolt for tightening said bracket on said second pivot pin whereby rotation of said second pin may be stopped, a frame supporting member fixed to said second pivot pin, a depending bearing plate fixed to said frame supporting member, opposed spaced alignment arms rotatably mounted on said frame supporting member, said arms being provided with gear teeth which respectively engage each other, means connected to said arms for stopping rotation of both said alignment arms, head pads respectively attached to the free ends of said alignment arms, a frame pivotally mounted on said frame supporting member, and an alignment wire carried by said frame in a plane midway between said head pads for aligning the nose of a person whose head is engaged by said head pads.

9. A device for supporting a human head while making X-ray pictures comprising a clamp for engaging the film-cassette of an X-ray apparatus for mounting said device on said film-cassette, a pivot pin fixed to said clamp, a bracket pivotally mounted on said pivot pin, a second pivot pin journaled for rotation in said bracket, a frame supporting member fixed to said second pivot pin, a depending bearing plate fixed to said frame supporting member, mounting studs on said bearing plate, opposed spaced alignment arms rotatably mounted on said mounting studs, said arms being provided with gear teeth which respectively engage each other, nuts threadably engaging said mounting studs, a nut actuating arm attached to one of said nuts whereby said arm may be actuated to tighten said nut to stop rotation of both said alignment arms, head pads respectively attached to the free ends of said alignment arms, a frame pivotally mounted on said frame supporting member, and an alignment wire carried by said frame in a plane midway between said head pads for aligning the nose of a person whose head is engaged by said head pads.

10. A device for supporting a human head while making X-ray pictures comprising means for engaging the film-cassette of an X-ray apparatus for mounting said device on said film-cassette, a pivot pin fixed to said means, a bracket pivotally mounted on said pivot pin, means for tightening said bracket on said pivot pin whereby pivotal motion of said bracket may be stopped, a second pivot pin journaled for rotation in said bracket, means for tightening said bracket on said second pivot pin whereby rotation of said second pin may be stopped, a frame supporting member fixed to said second pivot pin, a depending bearing plate fixed to said frame supporting member, mounting studs on said bearing plate, opposed spaced alignment arms rotatably mounted on said mounting studs, said arms being provided with gear teeth which respectively engage each other, means to stop rotation of both said alignment arms, head pads respectively attached to the free ends of said alignment arms, a frame pivotally mounted on said frame supporting member, and an alignment wire carried by said frame in a plane midway between said head pads for aligning the nose of a person whose head is engaged by said head pads.

11. A device for supporting a human head while making X-ray pictures comprising a clamp for engaging the film-cassette of an X-ray apparatus for mounting said device on said film-cassette, a pivot pin fixed to one of said clamps, a bracket pivotally mounted on said pivot pin, means for tightening said bracket on said pivot pin whereby pivotal motion of said bracket may be stopped, a second pivot pin journaled for rotation in said bracket, means for tightening said bracket on said second pivot pin whereby rotation of said second pin may be stopped, a frame supporting member fixed to said second pivot pin, a depending bearing plate fixed to said frame supporting member, mounting studs on said bearing plate, opposed spaced alignment arms rotatably mounted on said mounting studs, said arms being provided with gear teeth which respectively engage each other, nuts threadably engaging said mounting studs, a nut actuating arm attached to one of said nuts whereby said arm may be actuated to tighten said nut to stop rotation of both said alignment arms, head pads respectively attached to the free ends of said alignment arms, a frame pivotally mounted on said frame supporting member, and an alignment wire mounted on said frame in a plane midway between said arms for aligning the nasal spine at a point centered between the eyes matching the occipital protuberance with the center vertical line of said cassette.

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