May 23, 1961 J. A. MAURER ET AL 2,985,226

ARM REST CONSTRUCTION

Filed Nov. 5, 1959 4 Sheets-Sheet 1

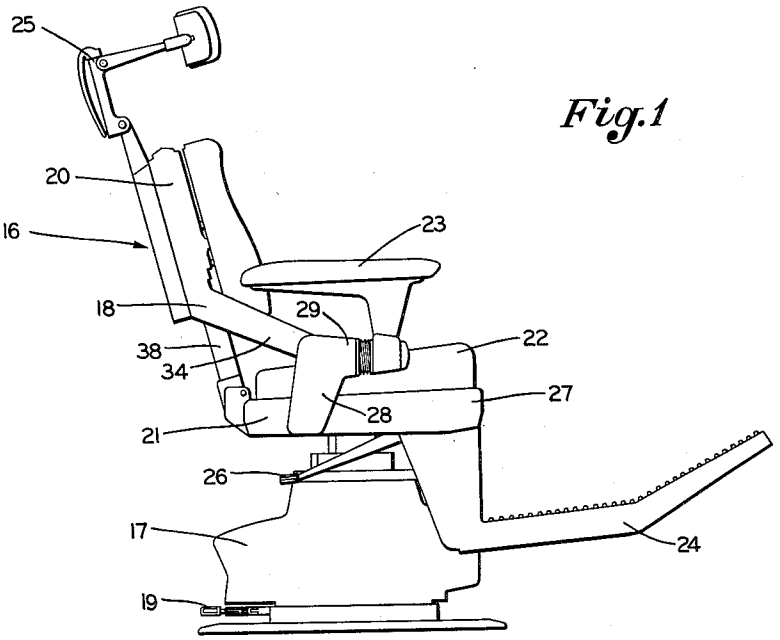


Fig. 1

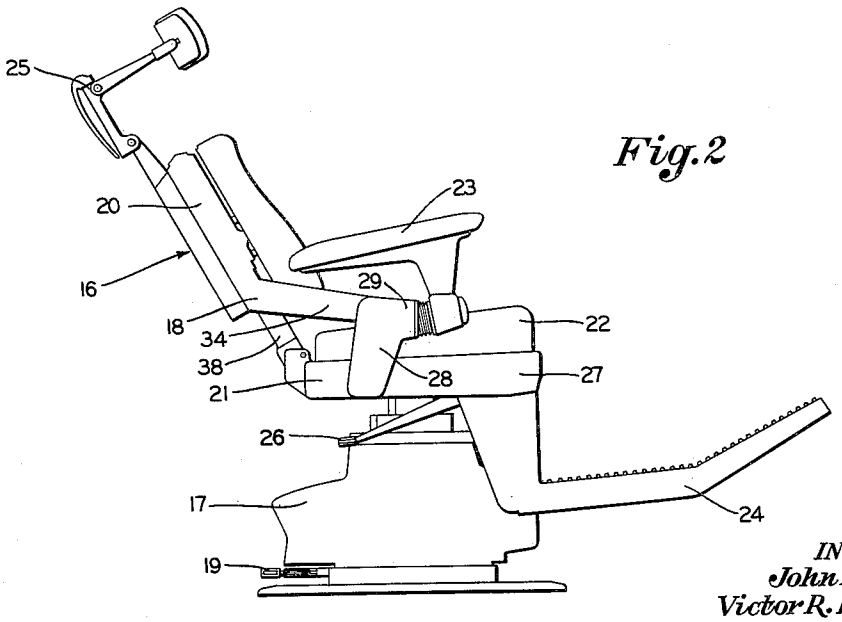


Fig. 2

INVENTORS
John A. Maurer,
Victor R. Ferguson and
Clarence G. Taylor

BY Frease, Bishop, Johns & Schick

ATTORNEYS

May 23, 1961 J. A. MAURER ET AL 2,985,226

ARM REST CONSTRUCTION

Filed Nov. 5, 1959 4 Sheets-Sheet 2

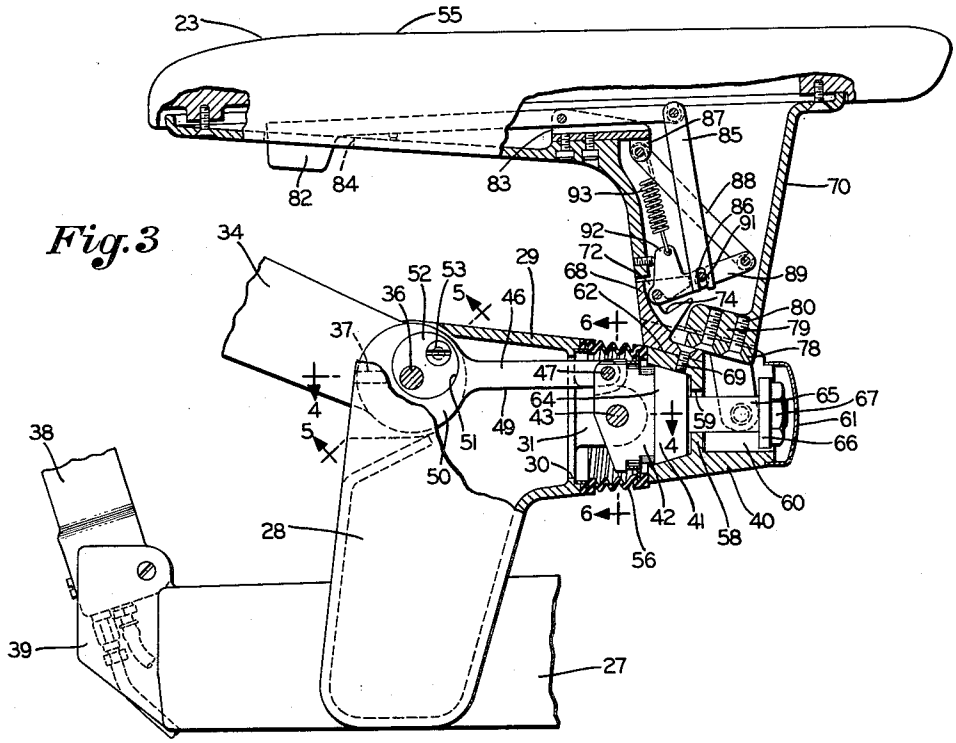


Fig. 3

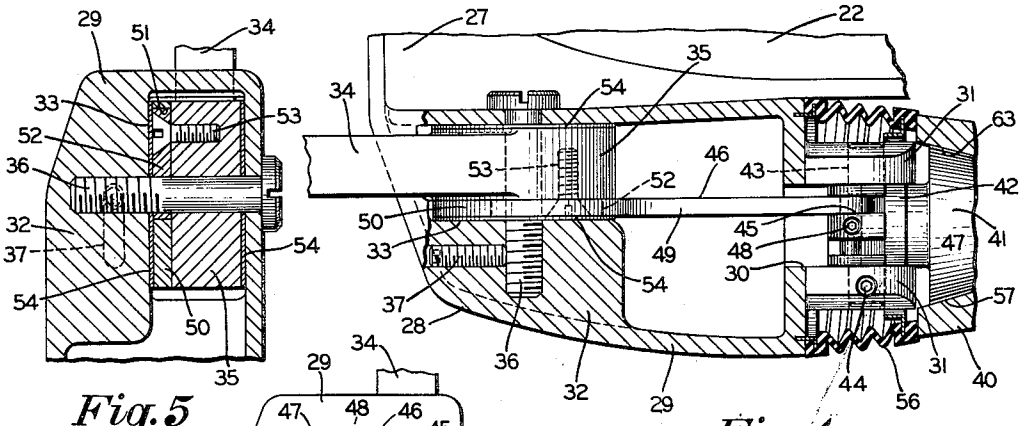


Fig. 4

Fig. 5

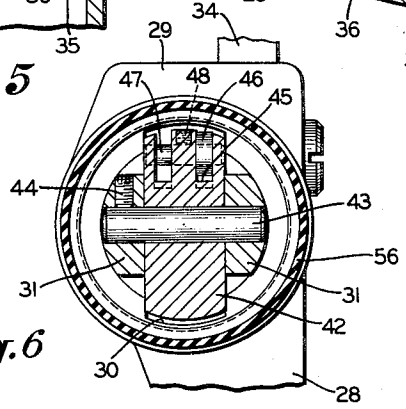


Fig. 6

INVENTORS
John A. Maurer,
Victor R. Ferguson and
Clarence G. Taylor Jr.

BY Frease, Bishop, Johns & Schick

ATTORNEYS

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ARM REST CONSTRUCTION

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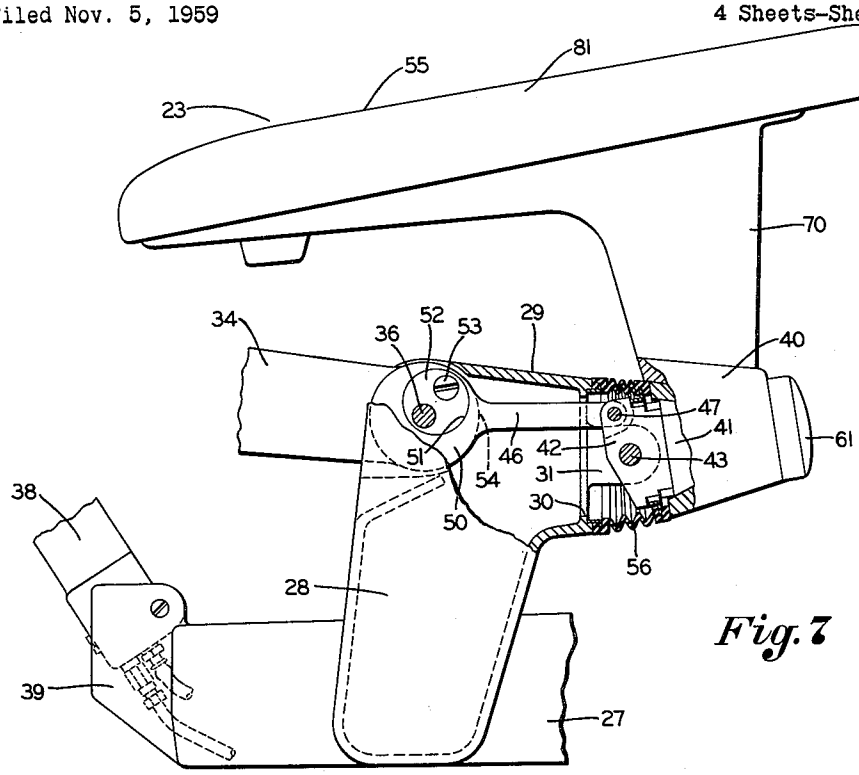


Fig. 7

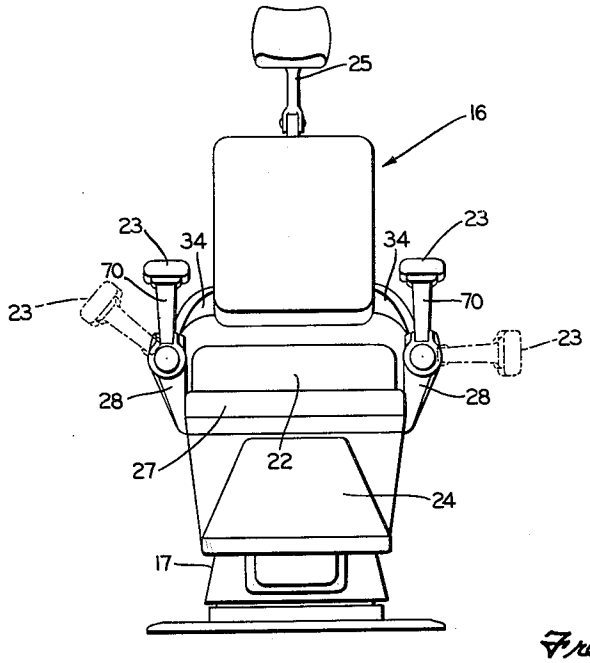


Fig. 8

INVENTORS
John A. Maurer,
Victor R. Ferguson and
BY Clarence G. Taylor

Frease, Bishop, Johns & Schick

ATTORNEYS

May 23, 1961 J. A. MAURER ET AL 2,985,226

ARM REST CONSTRUCTION

Filed Nov. 5, 1959 4 Sheets-Sheet 4

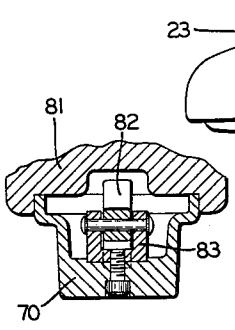


Fig. 11

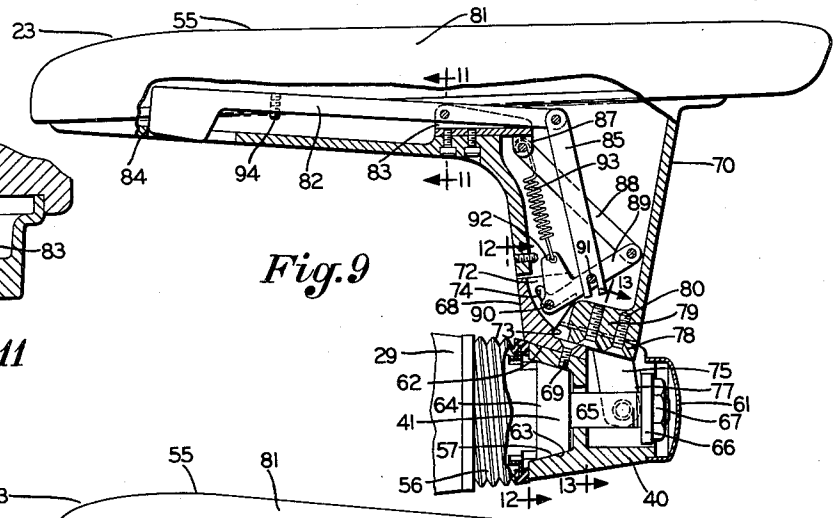


Fig. 9

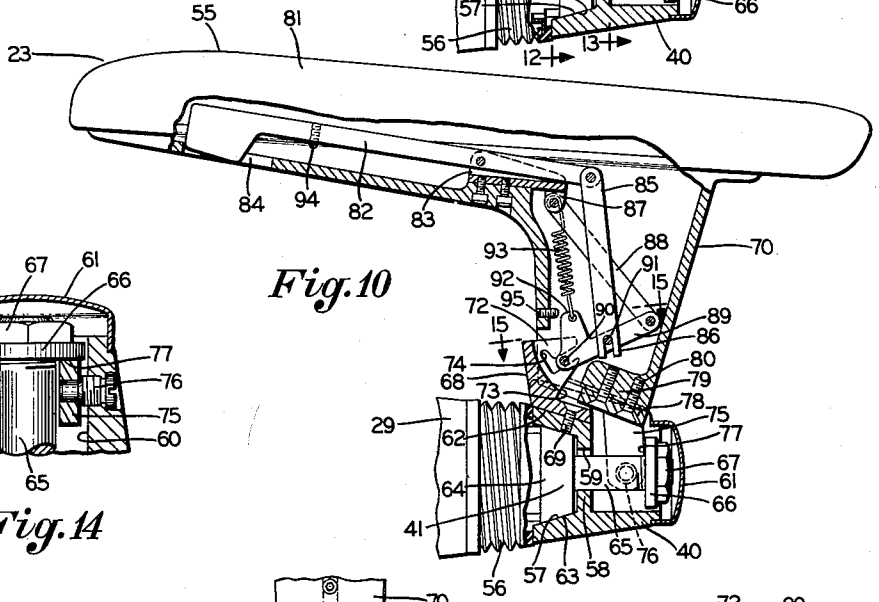


Fig. 10

Fig. 14

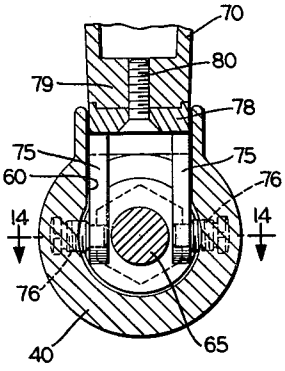


Fig. 13

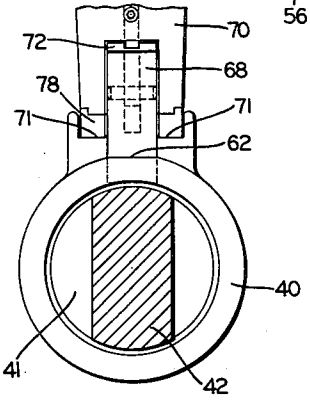


Fig. 12

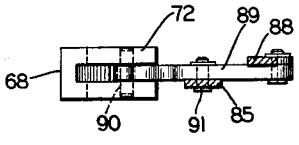


Fig. 15

INVENTORS
John A. Maurer,
Victor R. Ferguson and
Clarence G. Taylor
BY Frease, Bishop, Johns & Schick
ATTORNEYS

United States Patent Office 2,985,226 Patented May 23, 1961

2,985,226

ARM REST CONSTRUCTION

John A. Maurer and Victor R. Ferguson, Canton, Ohio, and Clarence G. Taylor, Oxnard, Calif., assignors to The Weber Dental Manufacturing Company, Canton, Ohio, a corporation of Ohio

Filed Nov. 5, 1959, Ser. No. 851,170

22 Claims. (Cl. 155—25)

Our invention relates to improvements in arm rest construction preferably for dental chairs and the like. More specifically, our invention relates to improvements in an arm rest construction for reclining chairs such as those used in the dental profession, which improvements may include either or both of the unique features of the arm rest automatically tilting rearwardly as the back of the chair is tilted rearwardly, and selective lateral pivoting of the arm rest toward and away from the seat portion of the chair.

Most prior constructions of reclining chairs, such as those used in the dental profession, have included a rearwardly tilting back on the chair for positioning the patient in a reclining position to make the patient more accessible and convenient for work, such as the various dental operations to be performed. Further, these prior constructions have included straight non-tilting arm rests so that the upper surface of the arm rest, which normally extends generally horizontal, is in proper position for the patient prior to moving the chair to a reclining position, but when the chair is moved to this reclining position, these straight non-tilting arm rests have not provided proper support for the patient's arms.

Certain attempts have been made to solve this problem, that is, the proper positioning of the arm rests for proper support of the patient's arms when the chair back is lowered or moved to a reclining position. For instance, one such attempt is to form the arm rest with a progressively arcuate upper supporting surface, with the rearward portion of the arm rest curving rearwardly and downwardly, so that as the back is lowered there will always be a portion of the arm rest providing a supporting surface at approximately the correct angle for supporting the patient's arms.

This, however, has necessitated the use of relatively long arm rests which are expensive to fabricate and are bulky, thereby minimizing the accessibility of the patient to the dentist for performing the necessary dental operations. Furthermore, in order to provide a supporting surface on the arm rest in substantially the proper angled position for every position of the back rest of the chair, it is necessary to provide the arm rests arcuate throughout the lengths thereof so that the arm rests do not in any location provide a relatively flat proper supporting surface for the patient's arms.

Certain prior constructions of dental chairs and the like have also been provided with some form of arm rest which may be selectively pivoted laterally toward and away from the sides of a patient seated in the chair. One purpose of such laterally pivotal movement for the arm rest is so that the arm rest may be moved laterally inwardly in proper position for a patient of small stature, such as a child, but more important it provides extreme convenience for a dentist to be able to pivot one or both of the arms laterally away from the patient in order that the dentist may more closely approach the patient and be in a more convenient position for performing the necessary dental operations.

One such form of prior laterally pivotal arm rest construction makes use of a simple rack and pawl connection between the arm rest and the support frame of the chair so that by selectively releasing the pawl from engagement with the rack, it is possible to move the arm rest laterally pivotally to a series of spaced positions. The principal difficulty with this prior form of construction is that only certain set spaced positions are provided, and it is impossible to position the arm rest at any position in between these set positions, thereby sometimes destroying the entire usefulness of the construction.

Another prior construction of laterally pivotal arm rest has made use of a pair of cam engaged selectively releasable cooperating friction surfaces, with the cam release and engagement being controlled by a release lever extending upwardly beside or within the major portion of the arm rest. Although this form of construction may be moved to virtually any desired laterally pivotal position, the release lever for controlling the cam engagement has been exposed to accidental movement so that it is possible to accidentally release the arm rests causing them to be freely pivotal and move away from proper arm supporting position.

It is, therefore, a general object of the present invention to provide an arm rest construction which solves the difficulties and overcomes the problems presented by the foregoing prior constructions.

It is a primary object of the present invention to provide an arm rest construction which may include one or both of the features of being automatically rearwardly tilted with a rearward reclining positioning of the back rest of the chair for being properly positioned to support the arms of a patient in any given back rest position, and an improved laterally pivotal connection to the chair frame for being selectively pivoted to any given and desired lateral position.

It is a further object of the present invention to provide an arm rest construction which is of a minimum and ideal length and which is operably connected to the chair frame and to the back rest through a unique linkage system, whereby as the back rest is tilted rearwardly into various reclining positions, the arm rest will be tilted a coordinated exact proper amount automatically for placing the arm rest in proper position for supporting the arms of a patient positioned in the chair in every reclined position of the back rest.

It is still a further object of the present invention to provide an arm rest construction in which the arm supporting portion of the arm rest is connected to the chair frame through a set of cams, which, upon release, permit laterally pivotal movement of the arm rest to any given desired lateral position and will retain the arm rest in such lateral position when re-engaged.

It is an additional object of the present invention to provide an arm rest construction which is selectively releasable for laterally pivoting with respect to the chair, which releasing action is accomplished by an upward forward tilting of the entire arm supporting portion, thereby virtually eliminating the possibility of any accidental release of the arm rest.

It is also an object of the present invention to provide an arm rest construction which may be selectively released for laterally pivotal movement only by an upward forward tilting of the entire arm supporting portion thereof, which arm supporting portion is retained locked in non-releasing position by a specifically formed latch controlled by a release lever telescoped within the rear portion of the arm rest supporting portion, thereby making the release lever inaccessible to a patient supported in the chair.

Finally, it is an object of the present invention to provide an arm rest construction satisfying all of the fore-

going objects in a unique and efficient manner, but yet which may be provided at a minimum of expense.

These and other objects are accomplished by the parts, constructions, arrangements, combinations and subcombinations comprising the present invention, the nature of which is set forth in the following general statement, a preferred embodiment of which—illustrative of the best mode in which applicants have contemplated applying the principles—is set forth in the following description and illustrated in the accompanying drawings, and which is particularly and distinctly pointed out and set forth in the appended claims forming a part hereof.

In general terms, the arm rest construction for dental chairs and the like comprising the principles of the present invention may be stated as including an arm rest mounted on the chair for automatic movement of the arm rest to a generally horizontally extending position upon movement of the chair back rest to an upright position and for coordinated automatic movement of the arm rest to rearwardly downwardly angled positions upon movement of the back rest to rearwardly inclined positions. Further, the principles of the present invention may include an arm rest mounted on the chair frame for laterally pivotal movement with reference to the chair frame, with the arm rest being released for said laterally pivotal movement by a longitudinal tilting of the complete arm supporting portion of the arm rest.

More specifically, for providing the rearward longitudinal tilting of the arm rest or arm rests automatically in a preselected coordinated movement, with the rearward tilting or reclining of the chair back rest, the back rest is longitudinally pivotally connected to the chair frame, and also the arm rest is longitudinally pivotally connected to the chair frame, preferably spaced from the pivotal connection of the back rest. Further, a pivot link is preferably connected by eccentric movement means between the arm rest at the arm rest pivotal connection to the chair frame and the back rest at the back rest pivotal connection to the chair frame, whereby a given longitudinal pivotal movement of the back rest causes a like and coordinated pivotal movement of the arm rest, so that the arm rest is always in proper position for supporting the arm of a patient seated in the chair in every longitudinal pivotal movement of the back rest.

Also, more specifically, for providing the laterally pivotal movement of the arm rest or arm rests on the chair frame, a pivot member is laterally pivotally connected to the chair frame and the arm supporting member of the arm rest is longitudinally pivotally connected to this pivot member, with the arm supporting member being longitudinally pivotal between a first and second position and preferably retained in the first position by releasable latch means. Further, means is provided preferably in the form of one or more cam plates operably connected to the arm supporting member and preferably a friction cone member operably connected to the arm supporting member, with both being pivotal with respect to a cooperating cone member and cam washer mounted on the chair frame, whereby movement of the arm supporting member longitudinally pivotally to its first position engages the cam plate with the cam washer forcing a tight frictional engagement between the respective cone members and securely retaining the pivot member and arm supporting member against lateral pivotal movement with respect to the chair frame.

Finally, the positioning of the various cam plate, cam washer and cone members is such that upon longitudinal pivotal movement of the arm rest to its second position, the cam plate disengages from the cam washer, releasing the tight frictional engagement between the cone members and thereby permitting free lateral pivotal movement of the pivot member and arm supporting member with reference to the chair frame. Thus, by longitudinal pivotal movement of the arm supporting member to its second position, the pivot member and arm supporting

member may be freely laterally pivotally moved to any selected lateral pivoted position; and then by longitudinal pivotal movement of the arm supporting member to its first position, the pivot member and arm supporting member will be securely retained in this selected lateral pivoted position.

By way of example, an embodiment of the arm rest construction comprising the present invention is illustrated in the accompanying drawings forming a part hereof, wherein like numerals indicate similar parts throughout the several views, and in which:

Fig. 1 is a side elevation of a dental chair incorporating the arm rest principles of the present invention shown in a substantially upright position;

Fig. 2, a view similar to Fig. 1 but with the chair in a semi-lowered or reclining position;

Fig. 3, an enlarged fragmentary side elevation, with parts broken away and in section, showing the arm rest construction and the connection thereof to the chair conforming substantially to the upright positioning of the chair in Fig. 1;

Fig. 4, an enlarged fragmentary sectional view, part in elevation, looking in the direction of the arrows **4—4** in Fig. 3;

Fig. 5, an enlarged fragmentary sectional view, part in elevation, looking in the direction of the arrows **5—5** in Fig. 3;

Fig. 6, an enlarged fragmentary sectional view, part in elevation, looking in the direction of the arrows **6—6** in Fig. 3;

Fig. 7, an enlarged side elevation, with parts broken away and in section, showing the arm rest construction in a rearwardly tilted position substantially conforming to the partially lowered or reclining position of the chair in Fig. 2;

Fig. 8, a front elevation of the chair of Figs. 1 and 2, indicating possible laterally pivotal positions of the arm rest construction in broken lines;

Fig. 9, an enlarged fragmentary side elevation, with parts broken away and in section, of the arm rest construction, with the releasable latch thereof moved to released position and prior to the arm supporting portion being moved to a position releasing the arm rest for laterally pivotal movement;

Fig. 10, a view similar to Fig. 9, but with the arm supporting portion in an upwardly-forwardly tilted position, releasing the arm rest for laterally pivotal movement;

Fig. 11, an enlarged fragmentary sectional view, part in elevation, looking in the direction of the arrows **11—11** in Fig. 9;

Fig. 12, an enlarged fragmentary sectional view, part in elevation, looking in the direction of the arrows **12—12** in Fig. 9;

Fig. 13, an enlarged fragmentary sectional view, part in elevation, looking in the direction of the arrows **13—13** in Fig. 9;

Fig. 14, a fragmentary sectional view, part in elevation, looking in the direction of the arrows **14—14** in Fig. 13; and

Fig. 15, an enlarged fragmentary sectional view, part in elevation, looking in the direction of the arrows **15—15** in Fig. 10.

The arm rest construction of the present invention is illustrated in the drawings incorporated in a particular form of dental chair, generally indicated at **16** in Figs. 1, 2 and 8. It should be understood, however, that it is not intended to limit the principles of the present invention to the particular chair construction shown, but rather the principles of the present invention may be advantageously used in many forms of chair constructions, as will be evident from the following description.

Referring to Figs. 1, 2 and 8, the dental chair **16** may be comprised of a base or jack unit **17** and a chair assembly **18**. The jack unit **17** functions in the usual manner

for supporting the chair assembly **18** and permitting selective movement of the chair assembly to various vertical heights as controlled by the operating pedals **19**.

The chair assembly **18** includes the back rest portion **20** pivotally connected to the chair frame **21**, as will be hereinafter described in detail. Also, the chair frame **21** supports the seat portion **22**, the arm rest portions **23** and foot rest portion **24**.

The back rest portion **20** may mount a usual upwardly extending head rest assembly **25**, which head rest assembly may be adjusted to accommodate the particular patient seated in the dental chair **16** in the usual manner. Further, the entire chair assembly **18** may be mounted on the jack unit **17** pivotal for tilting as an entire unit or assembly, that is, without relative movement between the back rest portion **20**, chair frame **21**, seat portion **22**, arm rest portions **23**, foot rest portion **24** and head rest assembly **25**, in usual manner and may be controlled by the control pedal **26**.

As shown in Figs. 1 and 2, the chair frame **21** includes the usual base assembly **27** normally extending generally horizontally, which is secured to the jack unit **17** and supports the generally horizontally extending seat portion **22**. Base assembly **27** also supports the usual downwardly-forwardly and forwardly-upwardly angled foot rest portion **24**, as shown, extending from the front portion of base assembly **27**.

A pair of mounting arms **28** is secured to the base assembly **27**, one at either side thereof, spaced rearwardly from the foot rest portion **24** and normally extending generally vertically upwardly from the base assembly **27**. The mounting arms **28** are preferably generally inverted L-shaped in configuration, as viewed in side elevation, and include the upper generally horizontally extending leg portions **29** which are hollow providing a generally longitudinally extending opening therethrough opening forwardly in the generally vertically extending slotted forward opening **30**, defined by the forwardly extending laterally spaced mounting tabs **31**.

Leg portions **29** of the mounting arms **28** are provided internally at their rearward ends and laterally inwardly adjacent their outer sides with the mounting bosses **32**. The mounting bosses **32** are positioned laterally outwardly adjacent the slotted rearward openings **33**, all of this particular construction being for a purpose hereinafter described.

As shown in Figs. 1 through 7, the back rest portion **20** is provided with the normally forwardly-downwardly angled supporting arms **34** which extend forwardly from either side of the back rest portion and are received forwardly through the slotted rearward openings **33** of the mounting arms **28**. Inward of the mounting arms **28**, the supporting arms **34** are formed with laterally extending generally cylindrical connecting end portions **35** which are pivotally connected to the mounting arms **28** through the laterally extending pivot pins **36**. Pivot pins **36** extend laterally outwardly through the mounting arms **28** pivotally through the connecting end portions **35** and are threadably received in the mounting bosses **32** of the mounting arms **28**, being retained positioned therein by the usual set screws **37**.

Thus, the back rest portion **20** is pivotally connected to the chair frame **21** through the mounting arms **28** of the chair frame and the supporting arms **34** of the back rest portion, for pivotal movement of the back rest portion between upright and rearwardly angled or tilted reclining positions with reference to the seat portion **22**. Further, back rest portion **20** may be moved to any selected position and retained therein by the fluid cylinder assembly **38** which is operably connected to the back rest portion **20** and pivotally connected to the chair frame **21** substantially laterally midway of the base assembly **27** through the mounting bracket **39**, as shown.

As is evident from the drawings and the foregoing description, the two arm rest portions **23**, chair frame mounting arms **28** and the supporting arms **34** of the back rest portion **20**, respectively, are similar in construction, merely being adapted for the right or left-hand side of the chair assembly **18**. For this reason, in the following it is only necessary to consider the right-hand arm rest portion **23** and the various connections and mounting thereof to the particular chair frame mounting arm **28** and supporting arm **34** of the back rest portion **20**, and this will suffice for both the right and left-hand sides.

As shown best in Figs. 3, 4, 6 and 7, the lower end of the arm rest portion **23** is formed by a rearwardly opening generally cylindrical friction cone engagement member **40** which telescopically receives the friction cone member **41**, both of which will be hereinafter described in greater detail, but, for the present purposes, both normally solidly mount the remainder of the arm rest portion **23**. For the present purposes, the friction cone engagement member **40** serves as a pivot member for lateral pivotal movement of the arm rest portion **23**, and the friction cone member **41** forms the longitudinal axis for such movement. Furthermore, the cone engagement member **40** and cone member **41** are normally tightly frictionally engaged to thereby, for the present purposes, serve as a single mounting member.

Laterally midway of the friction cone member **41**, a normally generally vertically and rearwardly extending pivot plate **42** is secured to this friction cone member **41** and extends rearwardly laterally between the spaced mounting tabs **31** of the chair frame mounting arm **28**. Pivot plate **42** is vertically pivotally connected to the mounting tabs **31** through the laterally extending pivot pin **43**, which pivot pin is received through pivot plate **42** substantially midway of the height thereof and through the mounting tabs **31**, being retained positioned by the set screw **44**.

Pivot plate **42** at the upper portion thereof is provided with the upwardly-rearwardly opening slot **45** for reception of the forward end of the pivot link **46**, which pivot link is vertically pivotally retained therein by the pivot pin **47** received laterally through pivot plate **42** and pivot link **46**, being retained positioned by the set screw **48**. Thus, the forward end of the pivot link **46** is pivotally connected to the pivot plate **42** of the arm rest portion **23**, spaced a predetermined distance above the point of pivotal connection of this pivot plate **42** to the mounting tabs **31** of the chair frame mounting arm **28**.

As shown in Figs. 3 through 6, the pivot link **46** is preferably of substantially uniform lateral thickness throughout its length and includes the forwardly extending relatively narrow arm portion **49** terminating rearwardly in a generally laterally cylindrical mounting portion **50**. The mounting portion **50** is provided with an eccentric generally cylindrical and laterally extending opening **51** formed therethrough in the upper forward portion thereof, which opening encompasses the laterally extending axis of the mounting portion **50** and extends upwardly forwardly therefrom, terminating within mounting portion **50**.

Further, the mounting portion **50** is positioned slidably abutting the side of the connecting end portion **35** on the forward arm **34** between this connecting end portion and the mounting boss **32** of the mounting arm **28**, for instance as shown in Figs. 4 and 5. Further, the mounting portion **50** is supported laterally beside the connecting end portion **35** by the generally cylindrical pivot disc **52** received in the opening **51** of mounting portion **50**.

As shown in Figs. 3 and 5, the pivot disc **52** receives the pivot pin **36** pivotally therethrough near a lower rearward edge portion thereof and is secured laterally to and rotatable with the connecting end portion **35** by the fastening screw **53**, preferably diametrically opposite from the pivot pin **36** and near an upper forward edge portion of the pivot disc. Fastening screw **53** is received through the pivot disc **52** and is threadably engaged in the connecting end portion **35** so that the pivot disc is eccentrical-

ly rotatable with the connecting end portion around the pivot pin 36 and at the same time is rotatable within the opening 51 of the pivot link mounting portion 50.

Further, the pivot link mounting portion 50 is rotatably slidable with respect to the connecting end portion 35, but this relative rotatable slidable movement between the connecting end portion and the mounting portion is controlled by the pivot disc 52 moving with the connecting end portion 35 and within the mounting portion opening 51. In order to insure free rotatable or pivotal movement of the various connecting end portion 35, pivot link mounting portion 50 and pivot disc 52 around the pivot pin 36, the bearing washers 54 are positioned between the connecting end portion 35 and the inner portion of the mounting arm 28, and also between the pivot link mounting portion 50 and pivot disc 52 and the mounting arm mounting boss 32, which bearing washers 54 also aid in retaining these various elements assembled as described.

To summarize the foregoing construction, the back rest portion 20 is pivotally connected through the connecting end portion 35 to the chair frame mounting arm 28, and the arm rest portion 23 is pivotally connected through pivot plate 42 to the chair frame mounting arm 28, with the pivotal connection of the arm rest portion 23 being spaced longitudinally forwardly from the pivotal connection of the back rest portion 20. These two back rest and arm rest portions 20 and 23 are, however, connected for coordinated pivotal movement by the pivot link 46 which is eccentrically pivotally connected to each of the back rest connecting end portion 35 and arm rest pivot plate 42.

The eccentric pivotal connection of the pivot link 46 to the arm rest pivot plate 42 is necessary in order to provide a lever arm for pivoting the arm portion 23 around its pivotal connection to the chair frame, such motion being derived from the pivotal movement of the back rest portion 20. The purpose of the eccentric pivotal connection of the pivot link to the back rest connecting end portion 35, through the eccentric opening 51 formed in the pivot link mounting portion 50 receiving the pivot disc 52 eccentrically secured to the back rest connecting end portion 35, is to perfectly coordinate the pivotal movements of the back rest portion 20 and arm rest portion 23, since these two portions, due to their respective pivotal mountings to the chair frame 21, do not move the same pivotal distances in order to maintain the proper coordinated angular relationship between the supporting surface of the back rest portion 20 and the supporting surface of the arm rest portion 23.

The operation of this part of the present invention is best seen in Figs. 1, 2, 3 and 7. Figs. 1 and 3 show the dental chair 16 in a normal upright position, that is, with the back rest portion 20 extending generally upright with reference to the seat portion 22 and the arm rest portion 23 extending generally horizontally. Figs. 2 and 7 show the dental chair 16 in a rearward reclining position with reference to the seat portion 22 and the arm rest portion 23 being rearwardly angle conforming to the positioning of the back rest portion 20 for properly supporting the arms of a person positioned in the dental chair.

As shown in Fig. 3, in the upright position of the back rest portion 20, the friction cone engagement member 40 and friction cone 41 supporting the arm rest portion 23 extend forwardly substantially horizontally aligned with and forming a continuation of the leg portion 29 on the base assembly mounting arm 28, with the upper supporting surface 55 on arm rest portion 23 extending generally horizontally. As shown in Fig. 7, as the back rest portion 20 is angled rearwardly to a reclining position with reference to the seat portion 22, that is, to the position shown in Fig. 2, the back rest portion supporting arm 34 pivots rearwardly and downwardly around the pivot pin 36 and with reference to the chair frame mounting arm 28.

As the connecting end portion 35 of the supporting arm 34 rotates or pivots around the pivot pin 36, this also rotates the pivot disc 52 eccentrically around pivot pin 36 and within the opening 51 of the pivot link mounting portion 50. This pivoting or rotation of the supporting arm connecting end portion 35 and pivot disc 52 about the pivot pin 36 will be in a counterclockwise direction, as viewed in Figs. 3 and 7.

As the pivot disc 52 rotates slightly clockwise with the supporting arm connecting end portion 45 eccentrically around the pivot pin 36 and within the opening 51 of the pivot link mounting portion 50, this causes the pivot link 46 to move slightly longitudinally rearwardly within the base assembly mounting arm 28. This longitudinal rearward movement of the pivot link 46, in view of the pivotal connection of the pivot link arm portion 49 eccentrically with the pivot plate 42, causes pivot plate 42 to pivot or rotate slightly in a counterclockwise direction around the pivot pin 43, thereby tilting the entire arm rest portion 23 rearwardly to angle the upper supporting surface 55 of this arm rest portion downwardly rearwardly, but in exact controlled and coordinated relationship with the rearwardly reclining movement of the back rest portion 20.

Both of the arm rest portions 23, of course, operate in the same manner and are controlled in the same manner. Thus, the movement of both arm rest portions will be substantially identical and controlled and coordinated perfectly with the movement of the back rest portion 20 by the foregoing construction.

In view of the fact that the exposed surfaces of the mounting arms 28 on chair frame 21 and the arm rest portions 23, which are longitudinally adjacent, must be spaced apart longitudinally a determined distance in order to permit the tilting of the arm rest portions with reference to the mounting arms, for proper appearance resilient covers must be provided at these locations. For this reason, the resilient cover rings 56 are positioned telescoped with the outer surface portions of the friction cone engagement members 40 of the arm rest portions 23 and the mounting arms 28 of the chair frame 21, with these cover rings 56 preferably extending therebetween in accordion fashion.

Thus, according to the principles of one part of the present invention, an arm rest construction for dental chairs and the like is provided in which the arm rests are automatically moved to generally horizontally extending positions when the reclining back rest portion is moved to upright position, and the arm rest portions are automatically moved to coordinated downwardly-rearwardly tilted positions as the back rest portions are moved to rearwardly-angled reclining positions. Another equally important part of the present invention is shown in Figs. 3 and 8 through 14 and deals with the mounting of the arm rest portions 23 on the mounting arms 28 of the chair frame 21 for laterally pivotal movement with reference to the chair frame 21.

As previously described, the friction cone engagement members 40 are mounted on the mounting arms 28 of the chair frame 21 through the friction cone members 41. Since, again, the construction of the arm rest portions 23 are similar, with only certain parts being reversed for left and right-hand mounting, a detailed description of the one arm rest portion 23 and the operation thereof will suffice for both.

The friction cone engagement member 40 is generally cylindrical in outer configuration and preferably tapers somewhat conically as it extends forwardly from the chair frame mounting arm 28. Further, this engagement member 40 opens rearwardly toward the mounting arm 28 in an internal generally conically-extending friction surface 57, progressively decreasing in diameter forwardly. Friction surface 57 terminates forwardly within engagement member 40 in the generally laterally extending wall portion 58 through which is formed an opening 59 substantially centrally thereof.

Forwardly of the wall portion 58, the engagement member 40 is formed with an upwardly opening slot 60, with the engagement member also opening forwardly and being selectively closed forwardly by the telescoped cap member 61. Finally, the engagement member 40 is formed at the top outer surface thereof, overlying the friction surface 57 and wall portion 58, with a normally generally laterally extending and forwardly-downwardly angled flat surface portion 62.

The friction cone member 41 is received telescoped forwardly within the friction cone engagement member 40 and is formed with the generally conical friction surface 63 mating and normally frictionally engaging and abutting the friction surface 57 of the engagement member 40. The friction surface 63 of the friction cone member 41 is formed on the frusto-conical portion 64 which terminates forwardly spaced from the engagement member wall portion 58 in the forwardly projecting shaft portion 65.

Shaft portion 65 of the cone member 41 extends forwardly through the opening 59 formed through engagement member wall portion 58 and then forwardly through the engagement member slot 60 to within a short distance of the cap member 61. At the forward end of the shaft portion 65 is positioned the cam washer 66 which projects laterally outwardly from the shaft portion 65 and is retained thereon in a selected longitudinally adjusted position by the adjusting nut 67.

A stationary frame portion 68 is mounted on flat surface portion 62 of the engagement member 40 by the fastening screw 69 and extends vertically upwardly therefrom a predetermined distance, as shown in Figs. 3, 9, 10 and 12. Also, as shown, the stationary frame portion 68 extends forwardly along the flat surface portion 62 only the longitudinal length of this surface portion, terminating at the rearward edge of slot 60 within the engagement member 40, so that this stationary frame portion 68, similar to the flat surface portion 62, overlies the engagement member friction surface 57 and wall portion 58.

As can be seen in Fig. 12, the stationary frame portion 68 has a lateral width less than the lateral width of the pivotal frame portion 70 which forms the major part of the arm rest portion 23, the details of the pivotal frame portion being described hereinafter. Due to this narrow width of the stationary frame portion 68, however, when the pivotal frame portion 70 is in its normal position, as shown in Figs. 3 and 9, the stationary frame portion 68 is telescoped thereby, with the side edges of the pivotal frame portion 70 being received in appropriate recesses 71 of the engagement member 40 and laterally outward of the flat surface portion 62, as shown in Fig. 12.

Again, as shown in Figs. 3, 9, 10 and 12, the stationary frame portion 68 is somewhat triangular in side elevation or vertical cross section, sloping downwardly forwardly to the portion thereof overlying the engagement member wall portion 58, and the latch plate 72 is secured thereto and extends forwardly therefrom. Latch plate 72 is preferably positioned extending forwardly substantially laterally centrally of the stationary frame portion 68 and the forward edge of the latch plate extends downwardly and then downwardly rearwardly forming the clearance recess 73 generally overlying the latch plate 72 and overlying the forward part of the stationary frame portion 68, thereby providing clearance for pivotal movement of the pivotal frame portion 70, as will be apparent hereinafter.

Latch plate 72 has a generally L-shaped latch opening 74 formed laterally therethrough opening generally forwardly into the confines of the pivotal frame portion 70. Latch opening 74 begins at a rearward portion of the latch plate 72 and extends angled downwardly forwardly and then upwardly forwardly to finally open into pivotal frame portion 70, as shown in Figs. 3, 9 and 10.

The pivotal frame portion 70 is mounted on the friction cone engagement member 40 for longitudinal pivotal movement with respect to this engagement member by the laterally spaced generally downwardly extending cam plates 75. As shown in Figs. 3, 9, 10, 13 and 14, the cam plates 75 extend downwardly within the slot 60 of engagement member 40, with one cam plate clearing either side of the shaft portion 65 formed on the friction cone member 41.

Further, the cam plates 75 are pivotally mounted within the engagement member slot 60 to the engagement member 40 by the laterally opposed pivot pins 76 received laterally through engagement member 40, and with one pivotally engaging each of the cam plates 75. The forward cam surfaces 77 on the cam plates 75 are formed extending generally downwardly and then arcuately downwardly and rearwardly around the pivot pins 76, as shown, with the pivotal mounting of the cam plate 75 being in a particular predetermined relationship with the cam washer 66 mounted on the shaft portion 65 of the friction cone member 41, which relationship will be explained later in greater detail.

Cam plates 75 are mounted extending downwardly from a forwardly-downwardly angled and generally laterally extending foot plate 78, which foot plate normally overlies and abuts the forward part of the stationary frame portion 68 and extends forwardly therefrom to a point spaced rearwardly from the cap member 61 of engagement member 40. Foot plate 78 is secured upwardly to the rearwardly extending foot portion 79 of the pivotal frame portion 70 by the usual fastening screws 80, so that the cam plates 75 are secured stationary with respect to the remainder of the pivotal frame portion 70, thereby mounting the pivotal frame portion longitudinally pivotal with respect to the engagement member 40.

The pivotal frame portion 70 is hollow and extends upwardly from the foot portion 79 and then rearwardly to provide the frame upon which is mounted the normally generally horizontally extending arm rest cushion 81, which cushion forms the upper supporting surface 55 previously briefly mentioned. A latch control lever 82 is pivotally mounted on the pivotal frame portion 70 directly underlying the arm rest portion 81 by the pivot plate 83. The rearward portion of the latch control lever 82, which extends rearwardly of the pivotal connection thereof to the pivot plate 83, is accessible through the opening 84 formed through the under-surface of the pivotal frame portion 70, so that this latch control lever may be manipulated, as will be later described.

The forward portion of the latch control lever 82 extends forwardly from the pivotal connection thereof to the pivot plate 83 so that the extreme forward end of the latch control lever generally overlies the previously described latch plate 72 mounted on the stationary frame portion 68. A control arm 85 is pivotally connected to the forward end of the latch control lever 82 and normally extends downwardly and slightly forwardly to a point spaced forwardly from the forward edge of latch plate 72, with this control arm being formed at its lower end with a generally downwardly opening U-shaped slot 86.

A mounting lug 87 is formed extending downwardly from the front portion of the pivot plate 83, removed slightly laterally from the vertical plane of the latch control lever 82 and control arm 85. This mounting lug 87 pivotally mounts the upper end of a downwardly-forwardly extending latch arm 88 which extends downwardly to nearly the vertical level of the latch plate 72.

The forward end of the latch member 89 is pivotally connected to the lower end of the latch arm 88, with the latch member extending downwardly rearwardly laterally inside the latch plate 72. A generally laterally extending latch pin 90 is mounted at the forward lower portion of latch member 89, with this latch pin normally extending laterally into the latch opening 74 formed in the latch plate 72.

Intermediate the longitudinal length of the latch mem-

ber 89 is mounted the laterally extending control pin 91 over which is engaged the previously described lower end of the control arm 85, with pin 91 being received upwardly within the slot 86 in this control arm lower end. Finally, the latch member 89 is formed at its rearward end with an upwardly extending portion 92, and the tension spring 93 is engaged between this portion 92 and the mounting lug 87 on pivot plate 83, so that tension spring 93 normally urges the rearward end of the latch member 89 upwardly.

Various adjusting screws may be provided as required, such as the adjusting screw 94 on the rearward portion of the latch control lever 82 for limiting the downward pivotal movement of lever 82. An adjusting screw 95 is provided rearwardly adjacent the latch member 89 to retain this latch member engaged with the latch plate 72 when these members are in their engaged positions, as shown in Fig. 3, and a downward force is applied to the extreme front portion of the arm rest cushion 81.

In the operation of the second part of the present invention, the arm rest portions 23 are normally positioned laterally extending upwardly, as shown in full lines in Fig. 8, and these arm rest portions are in latched position, as shown in Fig. 3. As shown, the latch pin 90 of the latch member 89 is engaged in the latch opening 74 of the latch plate 72 so that, through the control arm 85 and latch arm 88, the arm rest portions 23 are retained with the upper supporting surfaces 55 of the arm rest cushions 80 normally extending generally horizontally.

Furthermore, the arm rest portions 23 are retained against laterally pivotal movement by the cam surfaces 77 of the cam plates 75 bearing forwardly against the rearward surface of the cam washer 66 at either side of the friction cone member shaft portion 65, thereby forcing the friction cone member 41 forwardly so that the friction surface 63 thereof is tightly frictionally engaged with the friction surface 57 of the friction cone engagement member 40. As shown in Fig. 3, when the pivotal frame portions 70 of the arm rest portions 23 are in their latched positions, the cam plates 75 extend downwardly, but are also angled slightly upwardly rearwardly from the pivot points thereof formed by the pivot pins 76. This positioning of the cam plates 75 forces the cam surfaces 77 thereof forwardly against the cam washer 66, causing the foregoing frictional engagement between the friction cone engagement member 40 and friction cone member 41. This frictional engagement, due to the particular connection of the friction cone members 41 with the respective chair frame mounting arms 28, securely retains the arm rest portions 23 against laterally pivotal movement.

When it is desired to laterally pivot one of the arm rest portions 23 either laterally inwardly or laterally outwardly and downwardly around the particular friction cone member 41, for instance, to positions such as those shown in broken lines in Fig. 8, the rearward end of the latch control lever 82 is moved upwardly to the position shown in Fig. 9. This causes the forward end of the latch control lever 82 to move downwardly forcing the control arm 85 downwardly, which in turn, through the slot 86 and control pin 91, forces the latch member 89 to angle a greater degree downwardly about the pivotal connection of this latch member to the latch arm 88.

That is to say, the rearward end of the latch member 89 moves downwardly within the latch opening 74 of the latch plate 72 while the entire latch member 89 swings slightly forwardly in pendulum fashion as determined by the pivotal connection thereof to the latch arm 88. Thus, the latch pin 90 moves downwardly within the latch opening 74 of the latch plate 72 to a position in which this latch pin is ready to move forwardly in the upwardly-forwardly angled portion of the latch opening 74.

At this point, as shown in Fig. 10, an upward force on the rearward portion of the arm rest cushion 81 or the pivotal frame portion 70 underlying this arm rest cushion, tilts the entire pivotal frame portion 70 forwardly, pivoting around the pivot pin 76 connecting the cam plates 75 to the friction cone engagement member 40. This tilts the upper supporting surface 55 of the arm rest portion 23 forwardly downwardly and also moves the cam plates 75 to a more nearly vertically extending position around the pivot pins 76, relieving the longitudinal forward pressure of the cam plate cam surfaces 77 against the rear surfaces of the cam washer 66.

As the longitudinal forward pressure on the cam washer 66 is relieved, this permits the friction cone engagement member 40 to move slightly longitudinally forwardly with reference to the friction cone member 41, thereby relieving the tight frictional engagement between the friction surfaces 57 and 63 of these members. With the relief of the tight frictional engagement between the friction cone engagement member 40 and friction cone member 41, the friction cone engagement member 40, stationary frame portion 68 and pivotal frame portion 70 are free to laterally pivot or rotate, so that the entire arm rest portion 23 pivots or rotates laterally except for the friction cone member 41.

When the particular arm rest portion 23 is in the desired laterally pivoted position, it is only necessary to apply a downward pressure at the rear portion of the arm rest cushion 81 and downwardly against the upper supporting surface 55. This causes the pivotal frame portion 70 to again assume the position shown in Fig. 3, with the latch pin 90 automatically re-engaging in the latch opening 74 of latch plate 72 as caused by the movement of the pivotal frame portion 70 and the resilient upward urging of the spring 93.

Thus, again the cam surfaces 77 of the cam plates 75 move longitudinally forwardly to exert a forward force on the cam washer 66, with the resultant forces urging the friction cone engagement member 40 to again tightly frictionally engage the friction cone member 41. This, therefore, again tightly retains the particular arm rest portion 23 in its newly assumed laterally pivoted position until selectively moved therefrom.

It is important to note that the pivotal frame portion 70 of these arm rest portions 23 must be tilted forwardly downwardly in order to release the particular arm rest portion 23 for laterally pivotal movement, which means that the entire arm supporting part of the arm rest portion must assume this forward tilted position and particularly including the arm rest cushion 81. The normal tendency, however, is for a patient seated in the chair to exert a greater force downwardly at the rearward portions of the arm rest cushions 81 so that this usual downward force by the patient tends to retain the arm rest portions 23 in their latched positions and tightly frictionally held from pivotal movement.

Furthermore, the access to the latch control lever 82 is in the rearwardmost part and at the underside of the pivotal frame portion 70, so that the latch control lever 82 is not in a position in which it would normally be accidentally moved to a released position by the patient seated in the chair. Thus, although the foregoing construction provides conveniently laterally pivotal arm rest portions 23 for dental chairs and the like, the unique construction thereof is such as to insure against accidental release of these arm rest portions and accidental lateral pivotal movement thereof. The construction, therefore, is such as to insure that these arm rest portions will remain in latched position until selectively and properly moved to a released position for the selected laterally pivotal movement.

Obviously, the two basic parts of the present invention, that is, the particular construction of the arm rest portions 23 longitudinally pivotally mounted on the chair frame 21 and operably connected to the back rest por-

tion 20 so that these arm rest portions will automatically tilt or pivot downwardly rearwardly in coordinated motion as the back rest portion is moved to rearwardly tilted reclining positions, and the particular construction mounting the arm rest portions 23 selectively laterally pivotal to any desired position with reference to the chair frame 21, may both be combined in the same chair construction as has been done in the particular embodiment illustrated in the drawings. Thus, all terms used in describing the second part of the construction must be considered from the relative standpoint with reference to the particular longitudinally tilted position of the whole assembly of the arm rest portions 23 with reference to the chair frame 21.

For instance, in the position of the back rest portion 20, shown in Fig. 1, the upper supporting surfaces 55 of the arm rest portions 23 will extend generally horizontally, and also the friction cone members 41, which support the arm supporting parts of each of the arm rest portions 23, will extend generally horizontally. When, however, the back rest portion 20 has been moved to a particular reclining position, as shown in Fig. 2, the upper supporting surfaces 55, and also the friction cone members 41 of these arm rest portions 23, will be angled upwardly forwardly or downwardly rearwardly, thereby providing a like relative position to all of the remaining parts of the arm rest portions 23.

Where the terms "forward" and "rearward" are used in the claims for defining movement of, for instance, the back rest portion of the construction, the term "forward" defines the direction generally to the right of the chair construction as shown in Figs. 1 and 2, and the term "rearward" defines the direction to the left. As an example, in Fig. 2 the back rest has moved to a rearwardly reclined position from the position shown in Fig. 1.

Furthermore, the "longitudinal" direction is the direction generally forwardly and rearwardly or generally to the right and left of the chair construction as shown in Figs. 1 and 2. Again, as an example, the back rest of the chair construction from the position of Fig. 1 to the position of Fig. 2 has moved longitudinally about a lateral axis. Also, as further examples, the arm rest movement of the chair construction from the position of Fig. 1 to the position of Fig. 2 has moved longitudinally about a lateral axis, and the locking and unlocking movement of the arm rest, as shown in Figs. 9 and 10, is a longitudinal movement about a lateral axis between the locking position shown in Fig. 9 and the unlocking position shown in Fig. 10.

Finally, the "lateral" direction is the direction generally to the right and left of the chair construction as shown in Fig. 8. An example of this is the movement of the arm rests of the chair construction between the full line positions and broken line positions as shown in Fig. 8 in which the arm rests are moving laterally about a longitudinal axis.

In the foregoing description, certain terms have been used for brevity, clearness and understanding, but no unnecessary limitations are to be implied therefrom, because such words are used for descriptive purposes herein, and are intended to be broadly construed.

Moreover, the embodiment of the improved construction illustrated and described herein is by way of example, and the scope of the present invention is not limited to the exact details of the construction shown.

Having now described the invention, the construction, operation and use of a preferred embodiment thereof, and the advantageous new and useful results obtained thereby; the new and useful construction and reasonable mechanical equivalents thereof obvious to those skilled in the art are set forth in the appended claims.

We claim:

1. Arm rest construction for a dental chair and the like having a rearwardly tilting reclining back including frame means on a chair for supporting a seat of the chair, pivot means operably connecting a back rest to the frame means for selective longitudinal pivotal movement of the back rest about a lateral axis between upright and rearwardly reclined positions with respect to the chair seat, arm rest means pivotally connected to the frame means for longitudinal pivotal movement about a lateral axis between generally horizontally extending and rearwardly-downwardly angled positions with respect to the chair seat, and pivot link means eccentrically pivotally connected to the back rest through said pivot means and operably connected to the arm rest means for automatically positioning the arm rest means extending generally horizontally upon selective movement of the back rest to upright position and progressively automatically moving the arm rest means to coordinated rearwardly-downwardly angled positions as the back rest is moved selectively progressively rearwardly to reclined positions.

2. Arm rest construction for a dental chair and the like having a rearwardly tilting reclining back including frame means on a chair for supporting a seat of the chair, pivot means operably connecting a back rest to the frame means for selective longitudinal pivotal movement of the back rest about a lateral axis between upright and rearwardly reclined positions with respect to the chair seat, arm rest means pivotally connected to the frame means for longituidnal pivotal movement about a lateral axis between generally horizontally extending and rearwardly-downwardly angled positions with respect to the chair seat, a pivot disc eccentrically connected to the back rest at said pivot means for eccentric rotatable movement upon pivotal movement of the back rest, pivot link means telescoped with the pivot disc eccentrically movable with the pivot disc through rotation of the pivot disc with respect to the pivot link means upon pivotal movement of the back rest, and the pivot link means being operably connected to the arm rest means for automatically positioning the arm rest means extending generally horizontally upon selective movement of the back rest to upright position and progressively automatically moving the arm rest means to coordinated rearwardly-downwardly angled positions as the back rest is moved selectively progressively rearwardly to reclined positions.

3. Arm rest construction for a dental chair and the like having a rearwardly tilting reclining back including frame means on a chair for supporting a seat of the chair, pivot means pivotally connecting a back rest to the frame means for selective longitudinal pivotal movement of the back rest about a lateral axis between upright and rearwardly reclined positions with respect to the chair seat, arm rest means pivotally connected to the frame means at a location spaced longitudinally forwardly from said pivot means for longitudinal pivotal movement of the arm rest means about a lateral axis between generally horizontally extending and rearwardly-downwardly angled positions with respect to the chair seat, and pivot link means eccentrically pivotally connected to the back rest at said pivot means and eccentrically pivotally connected to the arm rest means at the pivotal connection of said arm rest means to the frame means for automatically positioning the arm rest means extending generally horizontally upon selective movement of the back rest to upright position and progressively automatically moving the arm rest means to coordinated rearwardly-downwardly angled positions as the back rest is moved selectively progressively rearwardly to reclined positions.

4. Arm rest construction for a dental chair and the like having a rearwardly tilting reclining back including frame means on a chair for supporting a seat of the chair, pivot means operably connecting a back rest to the frame means for selective longitudinal pivotal movement of the back rest about a lateral axis between upright and rearwardly reclined positions with respect to the chair seat, arm rest means pivotally connected to the frame means at a location spaced longitudinally for-

wardly of said pivot means for longitudinally pivotal movement of the arm rest means about a lateral axis between generally horizontally extending and rearwardly-downwardly angled positions with respect to the chair seat, a pivot disc eccentrically connected to the back rest at said pivot means for eccentric rotatable movement upon pivotal movement of the back rest, pivot link means telescoped over the pivot disc eccentrically receiving said pivot disc and being eccentrically movable with the pivot disc through rotation of the pivot disc with respect to the pivot link means upon pivotal movement of the back rest, and the pivot link means being eccentrically connected to the arm rest means at the arm rest means pivotal connection to the frame means for automatically positioning the arm rest means extending generally horizontally upon selective movement of the back rest to upright position and progressively automatically moving the arm rest means to coordinated rearwardly-downwardly angled positions as the back rest is moved selectively progressively rearwardly to reclined positions.

5. Arm rest construction for a dental chair and the like having a main supporting frame including a mounting member operably connected to a chair main supporting frame, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal with the pivot member about said longitudinal axis and when in upwardly extending position supporting an arm of a persion seated in the chair, and engagement means operably connected to the arm supporting member engaged when the arm supporting member is in said first locking position and disengaged when the arm supporting member is in said second non-locking position for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said first locking position and for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis when the arm supporting member for said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said second non-locking position.

6. Arm rest construction for a dental chair and the like having a main supporting frame including a mounting member operably connected to a chair main supporting frame, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal with the pivot member about said longitudinal axis and when in upwardly extending position supporting an arm of a person seated in the chair, engagement means mounted on the arm supporting member engageable with the mounting member upon movement of the arm supporting member to said first locking position for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis, and the engagement means being released from the mounting member upon movement of the arm supporting member to said second non-locking position for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis with reference to the mounting member.

7. Arm rest construction for a dental chair and the like having a main supporting frame including a mounting member operably connected to a chair main supporting frame, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal with the pivot member about said longitudinal axis and when in upwardly extending position supporting an arm of a person seated in the chair, engagement means operably connected to the arm supporting member engaged when the arm supporting member is in said first locking position and disengaged when the arm supporting member is in said second non-locking position for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said first locking position and for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said second non-locking position, and selectively releasable latch means operably connected to the arm supporting member for normally retaining the arm supporting member in said first locking position and against said longitudinal pivotal movement about said lateral axis with respect to the pivot member.

8. Arm rest construction for a dental chair and the like having a main supporting frame including a mounting member operably connected to a chair main supporting frame, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal with the pivot member about said longitudinal axis and when in upwardly extending position supporting an arm of a person seated in the chair, engagement means mounted on the arm supporting member engageable with the mounting member upon movement of the arm supporting member to said first locking position for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis, the engagement means being released from the mounting member upon movement of the arm supporting member to said second non-locking position for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis with reference to the mounting member, and selectively releasable latch means operably connected between the arm supporting member and pivot member normally retaining the arm supporting member in said first locking position and against said longitudinal pivotal movement about said lateral axis with respect to the pivot member.

9. Arm rest construction for a dental chair and the like having a main supporting frame including a mounting member operably connected to a chair main supporting frame, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal with the pivot member about said longitudinal axis and when in upwardly extending position supporting an arm of a person seated in the chair, and friction engagement means operably connected to the pivot member and mounting member engaged when the arm supporting member is in said first locking position and disengaged when the arm supporting member is in said second non-locking position for frictionally retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis with respect to the mounting member when the arm supporting member is in said first locking position and for releasing the pivot mem-

ber and arm supporting member for said laterally pivotal movement about said longitudinal axis with respect to the mounting member when the arm supporting member is in said second non-locking position.

10. Arm rest construction for a dental chair and the like having a main supporting frame including a mounting member operably connected to a chair main supporting frame, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal with the pivot member about said longitudinal axis and when in upwardly extending position supporting an arm of a person seated in the chair, and cam engagement means operably connected between the arm supporting member and mounting member engaged when the arm supporting member is in said first locking position and disengaged when the arm supporting member is in said second non-locking position for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis with respect to the mounting member when the arm supporting member is in said first locking position and for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis with respect to the mounting member when the arm supporting member is in said second non-locking position.

11. Arm rest construction for a dental chair and the like having a main supporting frame including a mounting member operably connected to a chair main supporting frame, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal with the pivot member about said longitudinal axis and when in upwardly extending position supporting an arm of a person seated in the chair, friction engagement means operably connected with at least one of the pivot and arm supporting members and with the mounting member engageable when the arm supporting member is in said first locking position and disengageable when the arm supporting member is in said second non-locking position for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said first locking position and for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said second non-locking position, and cam engagement means operably connected to the arm supporting member and friction engagement means for moving the friction engagement means into engagement when the arm supporting member is moved to said first locking position and for moving the friction engagement means into disengagement when the arm supporting member is moved to said second non-locking position.

12. Arm rest construction for a dental chair and the like having a main supporting frame including a mounting member operably connected to a chair main supporting frame, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal with the pivot member about said longitudinal axis and when in upwardly extending position supporting an arm of a person seated in the chair, friction engagement means operably connected between the pivot member and mounting member engageable when the pivot member is urged longitudinally with respect to the mounting member and disengageable upon release of said longitudinal urging of the pivot member with respect to the mounting member for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis when engaged and for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis when disengaged, and cam engagement means operably connected between the arm supporting member and mounting member for urging the pivot member and arm supporting member longitudinally to engage the friction engagement means upon movement of the arm supporting member to said first locking position and for releasing the pivot member and arm supporting member from said longitudinal urging to disengage the friction engagement means upon movement of the arm supporting member to said second non-locking position.

13. Arm rest construction for a dental chair and the like having a main supporting frame including a mounting member operably connected to a chair main supporting frame, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal with the pivot member about said longitudinal axis and when in upwardly extending position supporting an arm of a person seated in the chair, telescoped generally conical and longitudinally extending friction surface means on the pivot member and mounting member engageable when the pivot member is urged longitudinally with respect to the mounting member and disengageable upon release of said longitudinal urging of the pivot member with respect to the mounting member for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis when engaged and for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis when disengaged, cam washer means connected to the mounting member, cam plate means connected to the arm supporting member longitudinally engageable with the cam washer means in any lateral pivotal position of the pivot member and arm supporting member with respect to the mounting member upon movement of the arm supporting member to said first locking position and disengageable from the cam washer means upon movement of the arm supporting member to said second non-locking position, and the cam washer and cam plate means urging the pivot member longitudinally with respect to the mounting member when engaged and releasing said longitudinal urging when disengaged.

14. Arm rest construction for a dental chair and the like having a main supporting frame including a mounting member operably connected to a chair main supporting frame, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal with the pivot member about said longitudinal axis and when in upwardly extending position supporting an arm of a person seated in the chair, friction engagement means operably connected between the pivot member and mounting member engageable when the pivot member is urged longitudinally with respect to the mounting member and disengageable upon release of said longitudinal urging of the pivot member with respect

to the mounting member for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis when engaged and for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis when disengaged, cam engagement means operably connected between the arm supporting member and mounting member for urging the pivot member and arm supporting member longitudinally to engage the friction engagement means upon movement of the arm supporting member to said first locking position and for releasing the pivot member and arm supporting member from said longitudinal urging to disengage the friction engagement means upon movement of the arm supporting member to said second non-locking position, and selectively releasable latch means operably connected between the arm supporting member and pivot member normally retaining the arm supporting member in said first locking position and against said longitudinal pivotal movement about said lateral axis with respect to the pivot member.

15. Arm rest construction for a dental chair and the like having a main supporting frame including a mounting member operably connected to a chair main supporting frame, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal about said longitudinal axis with the pivot member and when in upwardly extending position supporting an arm of a person seated in the chair, engagement means operably connected to the arm supporting member engaged when the arm supporting member is in said first locking position and disengaged when the arm supporting member is in said second non-locking position for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said first locking position and for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said second non-locking position, selectively releasable latch means operably connected to the arm supporting member for normally retaining the arm supporting member in said first locking position and against said longitudinal pivotal movement about said lateral axis with respect to the pivot member, the arm supporting member having a generally longitudinally extending arm supporting portion spaced from the pivot member and extending longitudinally rearwardly to a rearward end, the arm supporting portion rearward end having an under surface, and the latch means extending into the arm supporting portion and being accessible for release only through said under surface adjacent said rearward end.

16. Arm rest construction for a dental chair and the like having a rearwardly tilting reclining back including main supporting frame means on a chair for supporting a seat of the chair, a back rest pivotally connected to the frame means for selective longitudinal pivotal movement about a first lateral axis between upright and rearwardly reclined positions with respect to the chair seat, a mounting member pivotally connected to the frame means for longitudinal pivotal movement about a second lateral axis between various longitudinally pivoted positions with respect to the chair seat, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a third lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal about said longitudinal axis with the pivot member, engagement means operably connected to the arm supporting member engaged when the arm supporting member is in said first locking position and disengaged when the arm supporting member is in said second non-locking position for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said first locking position and for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said second non-locking position, and pivot coordinating means operably connected between the back rest and mounting member for automatically longitudinally pivoting the mounting member about said second lateral axis to a position in which the arm supporting member is extending generally horizontally upon selective movement of the back rest to upright position and progressively automatically longitudinally pivoting the mounting member about said second lateral axis to coordinated longitudinally pivoted positions in which the arm supporting member is in coordinated rearwardly-downwardly angled positions as the back rest is moved selectively progressively rearwardly to reclined positions.

17. Arm rest construction as defined in claim 16 in which selectively releasable latch means is operably connected to the arm supporting member for normally retaining the arm supporting member in said first locking position and against said longitudinal pivotal movement about said third lateral axis with respect to the pivot member.

18. Arm rest construction for a dental chair and the like having a rearwardly tilting reclining back including main supporting frame means on a chair for supporting a seat of the chair, pivot means operably connecting a back rest to the frame means for selective longitudinal pivotal movement of the back rest about a first lateral axis between upright and rearwardly reclined positions with respect to the chair seat, a mounting member pivotally connected to the frame means for longitudinal pivotal movement about a second lateral axis between various longitudinally pivoted positions with respect to the chair seat, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a third lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal about said longitudinal axis with the pivot member, engagement means mounted on the arm supporting member engageable with the mounting member upon movement of the arm supporting member to said first locking position for retaining the pivot member and arm supporting member against said laterally pivotal movement, about said longitudinal axis, the engagement means being released from the mounting member upon movement of the arm supporting member to said second non-locking position for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis with reference to the mounting member, and pivot coordinating means operably connected through said back rest pivot means to the back rest and operably connected to the mounting member for automatically longitudinally pivoting the mounting member about said second lateral axis to a position in which the arm supporting member is extending generally horizontally upon selective movement of the back rest to upright position and progressively, automatically longitudinally pivoting the mounting member about said second lateral axis to coordinated longitudinally pivoted positions in which the arm supporting member is in coordinated rearwardly-downwardly angled positions as the back rest is moved selectively progressively rearwardly to reclined positions.

19. Arm rest construction for a dental chair and the

like having a rearwardly tilting reclining back including main supporting frame means on a chair for supporting a seat of the chair, pivot means operably connecting a back rest to the frame means for selective longitudinal pivotal movement of the back rest about a first lateral axis between upright and rearwardly reclined positions with respect to the chair seat, a mounting member pivotally connected to the frame means for lingitudinal pivotal movement about a second lateral axis between various longitudinally pivoted positions with respect to the chair seat, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a third lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal about said longitudinal axis with the pivot member, friction engagement means operably connected to the pivot member and mounting member engaged when the arm supporting member is in said first locking position and disengaged when the arm supporting member is in said second non-locking position for frictionally retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis with respect to the mounting member when the arm supporting member is in said first locking position and for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis with respect to the mounting member when the arm supporting member is in said second non-locking position, and pivot link means eccentrically pivotally connected to the back rest at said back rest pivot means and operably connected to the mounting member for automatically longitudinally pivoting the mounting member about said second lateral axis to a position in which the arm supporting member is extending generally horizontally upon selective movement of the back rest to upright position and progressively automatically longitudinally pivoting the mounting member to coordinated longitudinally pivoted positions about said second lateral axis in which the arm supporting member is in coordinated rearwardly-downwardly angled positions as the back rest is moved selectively progressively rearwardly to reclined positions.

20. Arm rest construction for a dental chair and the like having a rearwardly tilting reclining back including main supporting frame means on a chair for supporting a seat of the chair, pivot means pviotally connecting a back rest to the frame means for selective longitudinal pivotal movement of the back rest about a first lateral axis between upright and rearwardly reclined positions with respect to the chair seat, a mounting member pivotally connected to the frame means at a location spaced longitudinally forwardly from said back rest pivot means for longitudinal pivotal movement of the mounting member about a second lateral axis between various longitudinally pivoted positions with respect to the chair seat, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a third lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal with the pivot member about said longitudinal axis, engagement means operably connected to the arm supporting member engaged when the arm supporting member is in said first locking position and disengaged when the arm supporting member is in said second non-locking position for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said first locking position and for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said second non-locking position, and pivot link means eccentrically pivotally connected to the back rest at said back rest pivot means and eccentrically pivotally connected to the mounting member at the pivotal connection of said mounting member to the frame means for automatically longitudinally pivoting the mounting member about said second lateral axis to a position in which the arm supporting member is extending generally horizontally upon selective movement of the back rest to upright position and progressively automatically longitudinally pivoting the mounting member about said second lateral axis to coordinated longitudinally pivoted positions in which the arm supporting member is in cordinated rearwardly-downwardly angled position as the back rest is moved selectively progressively rearwardly to reclined positions.

21. Arm rest construction for a dental chair and the like having a rearwardly tilting reclining back including main supporting frame means on a chair for supporting a seat of the chair, a back rest pivotally connected to the frame means for selective longitudinal pivotal movement about a first lateral axis between upright and rearwardly reclined positions with respect to the chair seat, a mounting member pivotally connected to the frame means for longitudinal pivotal movement about a second lateral axis between various longitudinally pivoted positions with respect to the chair seat, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a third lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal with the pivot member about said longitudinal axis, friction engagement means operably connected with at least one of the pivot and arm supporting members and with the mounting member engageable when the arm supporting member is in said first locking position and disengageable when the arm supporting member is in said second non-locking position for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said first locking position and releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis when the arm supporting member is in said second non-locking position, cam engagement means operably connected to the arm supporting member and friction engagement means for moving the friction engagement means into engagement when the arm supporting member is moved to said first locking position and for moving the friction engagement means into disengagement when the arm supporting member is moved to said second non-locking position, and pivot coordinating means operably connected between the back rest and mounting member for automatically longitudinally pivoting the mounting member about said second lateral axis to a position in which the arm supporting member is extending generally horizontally upon selective movement of the back rest to upright position and progressively automatically longitudinally pivoting the mounting member about said second lateral axis to coordinated longitudinally pivoted positions in which the arm supporting member is in coordinated rearwardly-downwardly angled positions as the back rest is moved selectively progressively rearwardly to reclined positions.

22. Arm rest construction for a dental chair and the like having a rearwardly tilting reclining back including main supporting frame means on a chair for supporting a seat of the chair, pivot means pivotally connecting a back rest to the frame, means for selective longitudinal pivotal movement of the back rest about a first lateral axis between upright and rearwardly reclined positions with respect to the chair seat, a mounting member pivotally connected to the frame means at a location spaced longitudinally forwardly from said back rest pivot means

for longitudinal pivotal movement of the mounting member about a second lateral axis between various longitudinally pivoted positions with respect to the chair seat, a pivot member laterally pivotally connected to the mounting member laterally pivotal about a longitudinal axis, an arm supporting member longitudinally pivotally mounted on the pivot member selectively longitudinally pivotal about a third lateral axis between a first locking and second non-locking position, the arm supporting member being laterally pivotal with the pivot member about said longitudinal axis, friction engagement means operably connected between the pivot member and mounting member engageable when the pivot member is urged longitudinally with respect to the mounting member and disengageable upon release of said longitudinal urging of the pivot member with respect to the mounting member for retaining the pivot member and arm supporting member against said laterally pivotal movement about said longitudinal axis when engaged and for releasing the pivot member and arm supporting member for said laterally pivotal movement about said longitudinal axis when disengaged, cam engagement means operably connected between the arm supporting member and mounting member for urging the pivot member and arm supporting member longitudinally to engage the friction engagement means upon movement of the arm supporting member to said first locking position and for releasing the pivot member and arm supporting member from said longitudinal urging to disengage the friction engagement means upon movement of the arm supporting member to said second non-locking position, selectively releasable latch means operably connected between the arm supporting member and pivot member normally retaining the arm supporting member in said first locking position and against longitudinal pivotal movement about said third lateral axis with respect to the pivot member, a pivot disc eccentrically connected to the back rest at said back rest pivot means for eccentric rotatable movement of the pivot disc upon pivotal movement of the back rest about said first lateral axis, pivot link means telescoped over the pivot disc eccentrically receiving said pivot disc and being eccentrically movable with the pivot disc through rotation of the pivot disc with respect to the pivot link means upon pivotal movement of the back rest about said first lateral axis, and the pivot link means being eccentrically connected to the mounting member at the pivotal connection of said mounting member to the frame means for automatically longitudinally pivoting the mounting member about said second lateral axis to a position in which the arm supporting member is extending generally horizontally upon selective movement of the back rest to upright position and progressively automatically longitudinally pivoting the mounting member about said second lateral axis to coordinated longitudinally pivoted positions in which the arm supporting member is in coordinated rearwardly-downwardly angled positions as the back rest is moved selectively progressively rearwardly to reclined positions.

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