May 26, 1942. O. S. CAESAR 2,284,129

CHAIR OR SEAT STRUCTURE AND FOOT REST CONSTRUCTION THEREFOR

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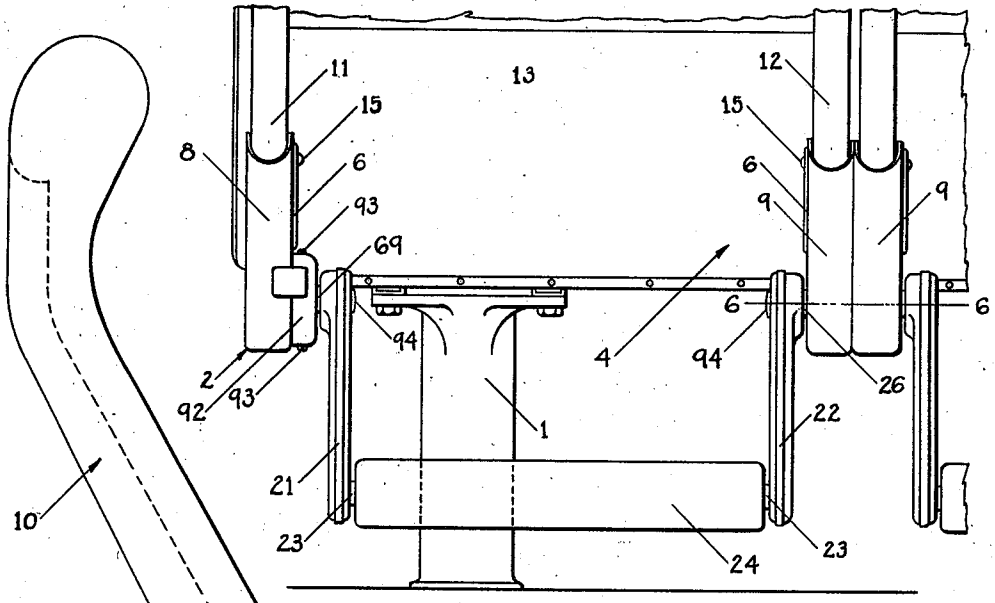



Fig. 1

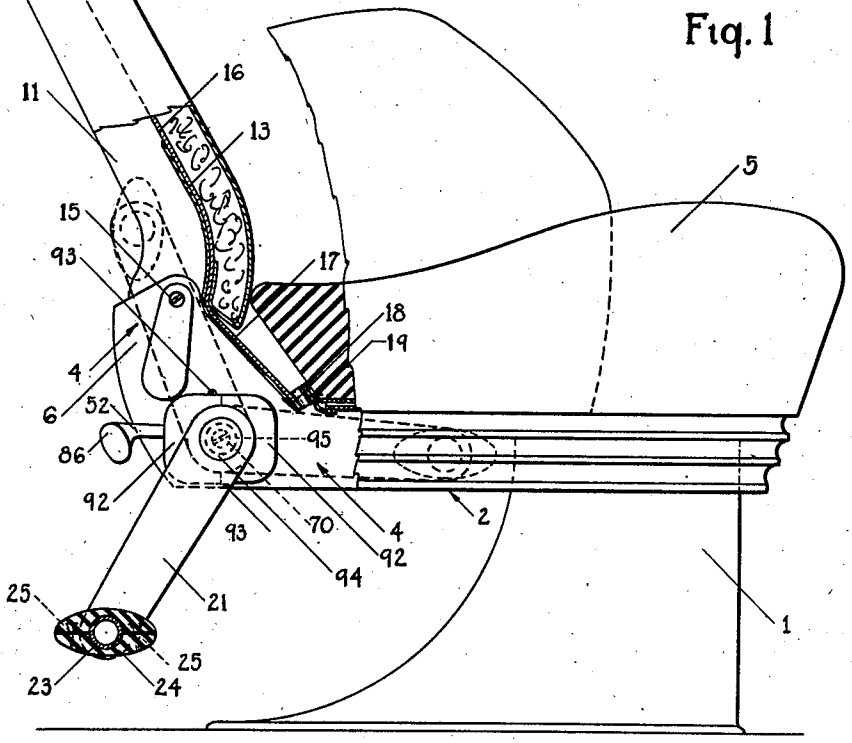



Fig. 2

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CHAIR OR SEAT STRUCTURE AND FOOT REST CONSTRUCTION THEREFOR

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Fig. 3

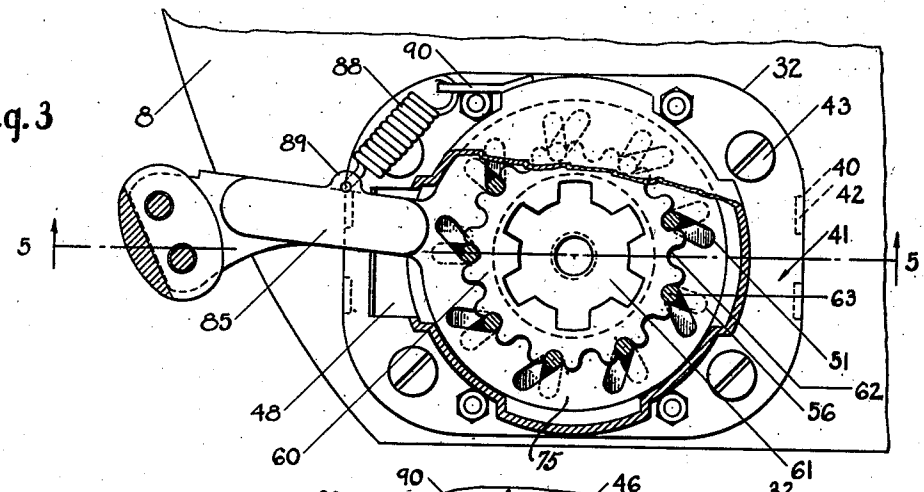



Fig. 4

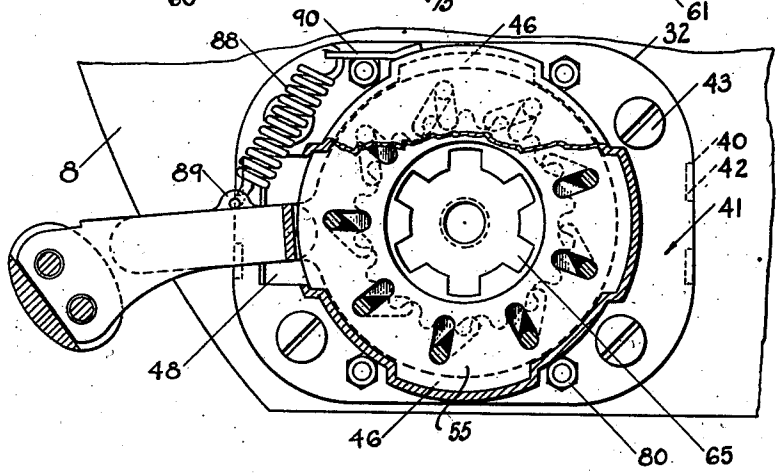
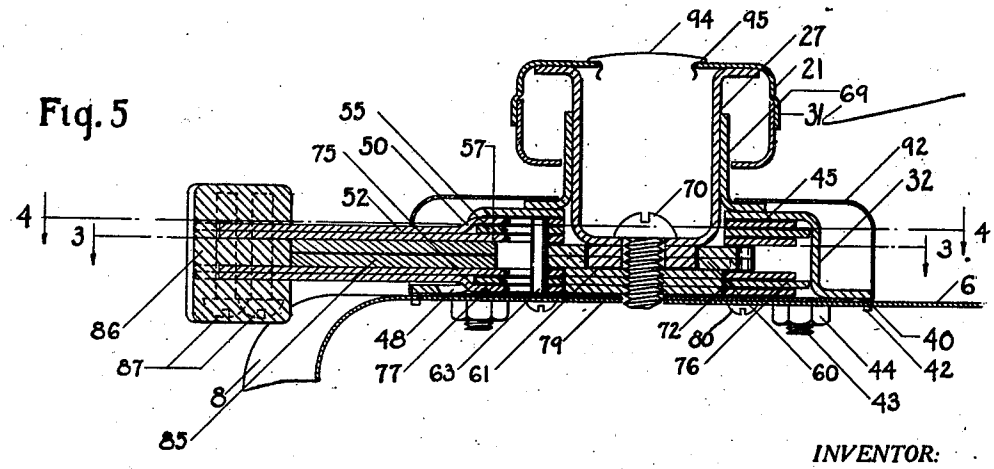



Fig. 5




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CHAIR OR SEAT STRUCTURE AND FOOT REST CONSTRUCTION THEREFOR

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Fig.7

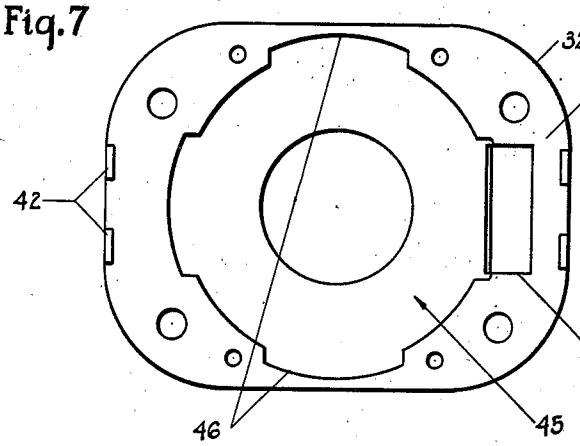



Fig.8

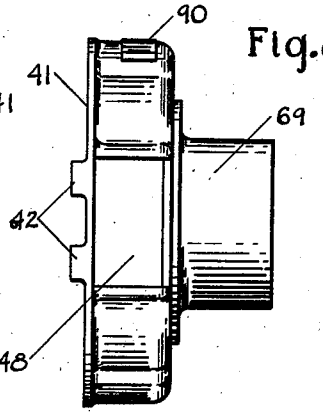



Fig.11

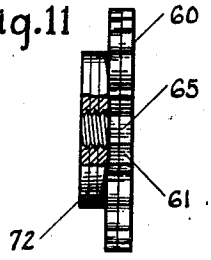



Fig. 9

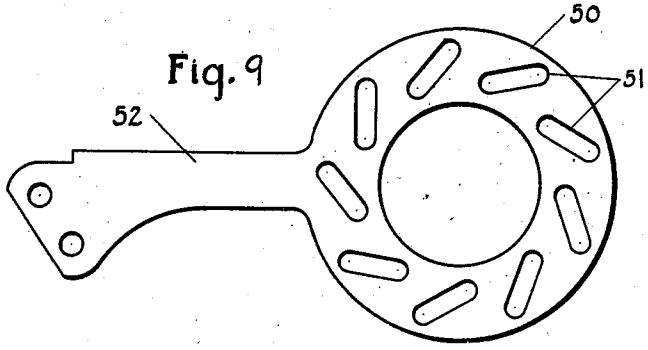



Fig.12

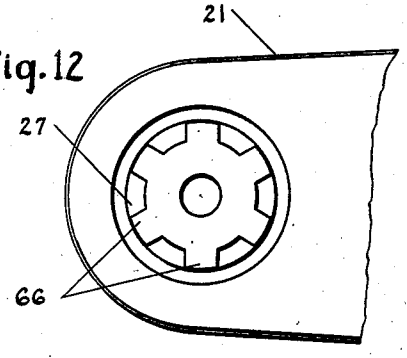



Fig.10

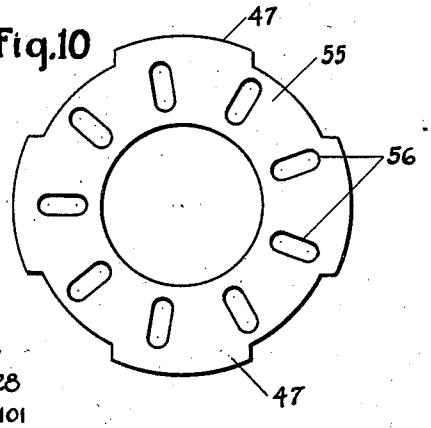



Fig.6

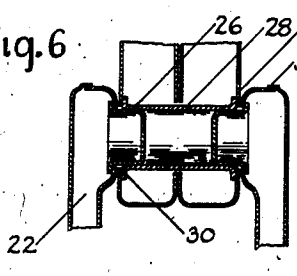
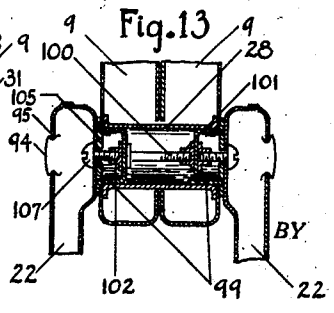



Fig.13




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Patented May 26, 1942 2,284,129

# UNITED STATES PATENT OFFICE

2,284,129

## CHAIR OR SEAT STRUCTURE AND FOOT-REST CONSTRUCTION THEREFOR

Orville S. Caesar, Barrington, Ill., assignor to Tropic-Aire, Incorporated, Chicago, Ill., a corporation of Delaware

Application September 27, 1940, Serial No. 358,580

22 Claims. (Cl. 155—171)

This invention relates to improvements in chair or seat structures and foot rest constructions therefor, as well as to a mechanism for adjustably, releasably holding a foot rest or other suitable structure at any one of a plurality of adjusted positions.

Objects of the invention are to provide a releasable holding and adjusting mechanism per se, as well as to provide a holding mechanism in combination with a foot rest, including novel assembly and mounting schemes.

Another object is to so mount a foot rest in relation to the back of a chair or seat as to permit the rest to be adjusted through an angle substantially greater than 180°, and so that it may be moved to forward or rear positions, at each of which it is spaced a substantial distance from the floor. An important feature of the invention is the provision of a unit-holding device of great strength, with a minimum of bulk, and with a minimum of thickness in an axial direction so that the device does not have to be embedded in a support, as is required in so many instances where foot rests are used on bus seats.

Another object is to provide a device which can be easily attached or detached and easily serviced or inspected, and which occupies only a minimum space transversely of the seat.

Features of the invention include: The specific construction of the holding device; the manner of assembling its parts; the manner of releasably connecting a foot rest structure to the holding device preparatory to assembly on a chair; the manner of connecting the mechanism to the chair; the arrangement of the foot rest in relation to the particular chair and to a particular recess therein to give a wide range of adjustment with a mechanism which can hold the foot rest at any location in a long arc of adjustment; the use of a pair of arms connected rigidly and having journaling projections and the relation of these projections respectively to a bearing in the seat and to the holding mechanism; the scheme of assembling the foot rest on the seat after connection of the adjusting and holding mechanism with the foot rest structure; all details of construction, and all broader ideas of means inherent in the disclosure.

Objects, features and advantages of the various phases of the invention will be brought out in the description of the drawings forming a part of this application, and in said drawings—

Figure 1 is a partial rear view of a twin bus seat structure illustrating one application of my invention;

Figure 2 is an elevation partly in section, looking from the wall side toward the isle side, and with the wall side shown in elevation;

Figure 3 is a section partly in elevation illustrating the adjusting and locking mechanism, taken on line 3—3 of Figure 5, approximately in the plane of the outer face of the toothed member or gear, parts of the foot rest structure being omitted, and with the mechanism in the normal or locking position;

Figure 4 is a view similar to Figure 3, but taken on line 4—4 of Figure 5, approximately in the plane of the outer face of the outermost stationary disk, and showing the mechanism in release position to allow free rotation of the toothed member or gear;

Figure 5 is a horizontal section taken approximately on line 5—5 of Figure 3 with the mechanism in locked position, and showing how the pivoting projection of the swinging arm of the foot rest structure is releasably secured to the toothed member or gear, and how this member is journaled in a tubular extension of the main casing;

Figure 6 is a detail horizontal section taken approximately on line 6—6 of Figure 1 showing how the second arm of the foot rest structure is detachably journaled to the base or chassis;

Figure 7 is a detail elevation of the casing per se viewing its interior;

Figure 8 is a detail end view of Figure 7;

Figure 9 is a face view of one of the rotatable disks showing its handle extension;

Figure 10 is a face view of one of the stationary disks;

Figure 11 is a detail edge elevation, partly in section, of the toothed member or gear;

Figure 12 is an end elevation of the pivoting projection of one of the arms of the foot rest structure showing the key which fits a corresponding key in the socket of the toothed member; and

Figure 13 is a view similar to Figure 6, illustrating a modification of structure and assembly of the foot rest and bearing therefor.

Referring to Figure 1 which is a partial rear elevation of a twin seat structure such as is used in buses, and also referring to Figure 2 which is an elevation partly in section, looking from the wall side toward the aisle side of the seat. The numeral 1 indicates a pedestal and the numeral 2 generally indicates the base or chassis supported on the pedestal. The wall side of the seat structure is suitably attached to the vehicle wall by means not shown. The construction of this

base or chassis has not been shown in detail in this application, but is the same illustrated in a copending application in which I am coinventor with another, said application bearing Serial No. 348,618, having been filed on July 31, 1940.

A feature herein is the construction of the base which provides a forwardly extending foot and shin-receiving recess at the back in the manner best shown in Figure 2, and the arrangement of my foot rest therein, as well as the foot rest arranged therein and in combination with the particular holding mechanism. This recess is generally indicated by the numeral **4**. The numeral has been applied at two places to show that the recess extends below as well as above the seating level of the chair. It is to be noted that the recess is continuous to a point underneath a removable seat or cushion section **5**, and that there are no obstructing cross-pieces at any point in the recess.

The sides of the recess **4** are in part defined by upright plane, lateral wall surfaces **6**, and these surfaces are part of what I will refer to as socket members **8** and **9**, the socket members **8** being on the aisle side and the wall side, and the socket members **9** being centrally arranged close to one another as shown in Figure 1.

Pivotally attached to the base is at back, which back is constituted by an inverted U-shaped frame generally indicated at **10**, which frame provides downward extensions which are preferably tubular, the extensions being generally indicated at **11**, **12** in Figure 1, and being received by the socket members **8** and **9**. Suitable pivoting means, not shown in detail but the position of which is indicated by the numeral **15**, secures the arms within the sockets. In the application before mentioned is illustrated a construction whereby the back can be swung to and held in a plurality of different angular positions with reference to the seat **5**.

The back frame **10** has a back cloth **16** bridging and stretched tautly across its sides and top. The lower portion **17** of the cloth extends downwardly and forwardly to form the top wall of the recess **4**. The lower end of the cloth is inserted in a metal clip **18** which is connected to the base as generally indicated at **19**. The back cloth has a flexible rubber facing **13** which protectingly extends entirely across the cloth and from the bottom of the cloth upwardly to a point a substantial distance above the pivot **15**. This facing serves as an anti-scuff element.

The present invention has a number of phases, one of which is the manner in which the foot rest is mounted so that it can be easily assembled and disassembled.

Referring to Figure 6, which is a section approximately on line **6—6** of Figure 1. The foot rest comprises arms **21** and **22** rigidly cross-connected by a tubular member **23**. Rotatable on this tube **23** is a foot rest **24** made in two parts secured by screws **25**. Each arm is provided with a bearing projection. The projection of arm **22** is indicated at **26**. The projection of arm **21** is indicated in Figure 5 at **27**. The function of the projection **26** is to engage in bearing **28** of the socket member **9**. The tubular member **28** traverses the walls of both socket members **9** as shown, and is suitably secured. The outer wall of each member **9** has an opening **30** through which the element **26** passes to engage bearing **28**. The element **26** is suitably secured as by welding to the arm **22** after passing through an opening in that arm. The arm is hollow and is made in two pieces, having a telescopic fit in the manner indicated at **31**. The pieces are soldered together along the line of fit. As can be seen, it is a simple matter to insert the projection **26** within the tube **28** by a movement in an axial direction. This provides a very simple bearing construction, which is a feature of the invention. There is enough play allowed between the projection and its bearing to permit the foot rest structure to be swung in a direction transverse to its axis after **26** is inserted in **28**.

Another feature of the invention herein is the manner of assembling the foot rest structure along with the means by which it can be adjustably held at a number of adjusted positions, the assembly of this adjusting and holding means with the foot rest being made before the foot rest itself is assembled within the recess. A feature is the arrangement whereby the element **26** can be first engaged with the bearing **28** or its equivalent, and then the foot rest structure with its adjusting and holding mechanism attached, can be moved to the positions of Figures 1 and 2 and thereafter held by simple application of screws, the casing **32** of the unit mechanism being merely engaged with inner face **6** of the element **8** as shown. Thus, the entire holding mechanism lies in an easily accessible position, but because of its unique structure occupies very little space in an axial direction. Heretofore, it has been the practice to arrange the holding device inside of some element like **8**, where it is inaccessible, and because of this arrangement the assembly and disassembly of the foot rest structure and its adjusting and holding mechanism is relatively difficult and time-consuming, and therefore expensive.

Referring first to Figures 3, 4 and 5. The specific construction and manner of making and assembling the parts are important features of the invention, although the invention is not entirely limited to either of those features. An adjusting holding mechanism for a foot rest must be strong because in use it often happens that children stand with full weight on the foot rest. Moreover, the foot rest must be relatively thin to take up as little space as possible in an axial direction. Moreover, for the sake of cheapness the construction should lend itself to stamping operations, and the present invention provides the advantages of strength, small cubical mass, axial thinness, cheapness and ease of assembly.

The mechanism is enclosed in the casing **32** which is adapted to be attached against a flat surface. In this instance, the casing is attached against the flat surface **6** of the tubular socket member **8**. For this purpose each socket member is provided with openings **40**. The marginal flange of the casing indicated at **41** is provided with marginal projections **42**, which enter the openings **40**. Four of these openings and projections are provided in this instance, and they serve to prevent any rocking or rotative motions of the casing after being secured by means of screws **43** and nuts **44**.

In assembling the parts the casing, the interior of which is shown in Figure 7, may be laid in a horizontal position and the plate-like parts successively dropped into place in the casing. The assembly scheme is a feature of the invention. The chamber of the casing, in this case generally cylindrical in contour, is indicated at **45** see Figures 4 and 5 and its cylindrical wall is pressed outwardly to provide recesses **46**, four in

number. Communicating with one of the recesses 46 and the chamber and extending through the cylindrical side of the casing is an opening 48 also see Figure 5, through which an operating lever, constituted by the extensions of a plurality of plates, extends.

Referring now to Figures 5 and 7, and assuming that the casing has been laid in a horizontal position with its main recess or chamber facing upwardly. There is first placed in the recess a movable plate 50 of the general form of Figure 9, which has therein a plurality of tangentially disposed slots 51. This plate has a handle extension 52 which is first passed through the opening 48. Next there is dropped in a stationary plate 55 which has radial slots 56 therein, equal in number to the slots 51 and disposed in register therewith for the passage of pins. This plate has extensions 47 that enter recesses 46 to hold it against rotation. Next there is dropped in a plate 57 which has tangential slots 51 therein in the same number as for the plates 50 and 55. The plate also has a handle extension 52, and is in all respects substantially like plate 50. Next the flat face of a toothed member or gear 60 is placed against the plate 57.

This member 60 has teeth which are somewhat like the teeth of a spur gear. The object of the teeth is to provide notches or recesses for receiving pins 63, which pins move in and are moved by the slots when plates 50 and 57 are moved in unison. The toothed member has a socket or recess 61. The recesses formed by the teeth are indicated at 62 and are adapted to receive pins 63, each of which passes through its own series of registered slots of plates 50, 55 and 57, and also through the corresponding registered slots in similar plates placed at the opposite side of the gear (see Figure 5). There is no intention to be limited to two handle plates. Only one may be used. The socket 61 of the gear is provided with radial key recesses 65 which cooperate with projections or key teeth 66 see Figure 12, attached or formed on pivoting projection 27 of arm 21 of the foot rest structure.

As before described, the arm 21 is rigidly connected by tube 23 with the arm 22. (See Figure 1.) It is a feature that the pivoting projection 27 and its key teeth 66 can be engaged with the recesses 65 of the toothed member by movement in an axial direction, or the recesses 65 can be engaged with the teeth 66 by movement in the same direction. The pivoting projection 27 is journaled in a bearing extension 69 of the casing 32 as best shown in Figure 5, and the pivoting projection 27 is releasably secured to the toothed member and in the socket 61 by means of a screw 70. This connection of the foot rest structure to the holding mechanism is made before attachment of the rest to the chair or other suitable structure.

To proceed with the description of the unit and the assembly of its parts. The toothed member is provided with a circular bearing boss 72, and over this boss is now placed another ring-like plate indicated at 75 which has slots therein corresponding in number and kind to those of the plates 50 and 57. This plate 75 also has a handle 52. Against the plate 75 is then laid a stationary ring-like plate 76 which has slots of the same number and kind as shown in the first mentioned stationary plate 55 at the opposite side of the gear, and plate 76 locks in the recesses 46. The bearing opening of the stationary plate 76 cooperates with the bearing boss or extension 72, and thus the tooth member 60 is centered and journaled by the stationary plate 76. The projection 27 is journaled in the extension 69 of the cover 32, and thus the parts 27 and 60, held together by screw 70, are journaled. There is now laid against the stationary plate 76 another ring-like plate 77 which has slots therein of the same number and kind as those of plates 50, 57 and 75. This plate 77 also has an opening which engages the boss 72 as a bearing. The inner circular surface of the chamber 45 cooperates with the circular outer edges of the ring-like plates 50 and 57 to form bearings. Finally, a thin cap plate 79 is laid over the outer surface and flange 41 of the casing 32, to secure the previously assembled elements therein, and screws and nuts generally indicated at 80 serve to hold the plate 79.

In introducing the plates 50, 57, 75 and 77 it is first necessary to pass the handle extension 52 of each through the opening 48. The handles of the plates 57, 75 are each provided with a projection 85, said projections being engaged during assembly. These projections 85 act as spacers and the combined thicknesses of the projections is about equal to that of the toothed portion of the gear 60. After assembly the arms 52 are suitably connected together by a block 86 through which pass fastening devices 87, as shown. The structures 52 and 86 are thus combined to form a handle for operating all movable discs simultaneously.

It will be clear from an inspection of Figure 3 that because of the angular relations of radial slots 56 in the stationary plates to those of the tangential slots 51 of the movable plates, the pins will be moved simultaneously on oscillation of the handle from a position of Figure 3 to that of Figure 4, which movement will cause the pins to move outwardly from the recess 62 of the gear and thus release the gear for rotation, and in turn release the part 27 which is an extension of the arm 21 of the foot rest structure. It will also be clear that the foot rest has a toothed member or gear rotatable therewith and that there are plates, one or more held stationarily and one or more rotatably mounted, and that the slots in the plates are registered in pairs and that there are pins passing through the registered slots. It will further be noted that rotation of the rotatable plates either causes the pins to prevent rotation of the gear and therefore of the foot rest, or causes the pins to be disengaged by the teeth to permit rotation of the gear or toothed member.

In order to normally maintain the pins in their inner or locked position as in Figure 3, a suitable spring 88 is provided. The spring is connected at one end to an ear 89, preferably on one of the spacer elements 85, and the opposite end of the spring is connected to an extension 90 on the side of the casing 32. It will be noted, of course, that release of the pins is made against action of the spring 88, as indicated in Figure 4. Only a relatively light spring is needed for this purpose, so that the operation of the handle is easy.

An important feature of this invention is the provision of a large number of adjustments for the foot rest. Moreover, insofar as the mechanism itself is concerned, an adjustment through a complete arc of a circle can be made by means of the structure herein. For this reason, as

shown in Figure 2, the rest has a very large range of movement and can be held in any position within that range and at a large number of different positions. As shown in this figure, the handle **52** projects rearwardly beyond the surface **6** and by inspection of Figure 1 it will be seen that the total thickness of the device in an axial direction is relatively very small, and that the device is in full view for inspection and repair.

It will be noted that the plates **50** and **77** are made in rights and lefts, but it is not necessary to make rights and lefts. Plates like **57** and **75**, without offsets, can be used alone with the stationary plates. The plates **57** and **75** are flat throughout their length and differ only in this respect from plates **50** and **77** which are offset. Of course, all plates may be flat and straight, and therefore interchangeable. It will further be understood that it is not necessary to have pairs of plates **50**, **57** and **75**, **77**, but that a single plate such as **57** or such as **50** can be used, so there is no intention to entirely limit the invention to the number of plates.

In this embodiment nine locking pins are used, but it will be evident that a greater or lesser number can be used. In the aggregate these nine pins give great strength, so that a foot rest controlled by this device the rest can sustain the weight of a person or of children jumping up and down on the foot rest. Ordinarily in these devices there are only three or four adjustment positions. The present device provides thirteen adjusted positions and the invention can be embodied to employ even a greater number, as many as thirty-six positions.

An advantage is that the pins have bearings in plates which are at opposite sides of the gear so that the load is evenly distributed in what is known as a double shear arrangement with the load distributed at two points, respectively at the opposite sides of the gear. Another advantage is that the device is an all-steel, pressed construction which is very cheap. Another advantage is the ease of assembly. Another advantage is the smoothness of operation.

The invention has been shown as applied to a bus seat structure and the explanation of its use may be made in relation to two of these seats, one behind the other, as placed in a bus, although only one seat is shown. Because a rearwardly seated passenger uses a foot rest placed on the seat in front of him, the foot rest must be adjustable toward and away from the person, and therefore toward and away from the forward seat, and must also be adjusted for level, that is, raised and lowered. It is also necessary in buses to have the foot rests so arranged that they can be swung to a level to facilitate the cleaning of the bus floor. Therefore, in a device of this kind, and particularly when used in the environment just described, a large range of movement of the foot rest is necessary and adjustments of the rest are frequently made. Therefore, the adjusting means must be simple of operation so that the adjustments can be quickly made.

Heretofore, the number of adjustments has been quite limited, as well as the total angular adjustment obtainable. In this case the total angular adjustment is in the neighborhood of 270° so that the rest may be brought to a position substantially parallel with the back surface of the back rest or substantially parallel with the bottom surface of the frame which supports the seat **5**, which is removable.

After attachment of the casing **32** to the chair structure or other subitable structure, a pair of finishing half-casings **92** are applied and each is held by a screw **93** threaded in the casing **32**.

A suitable finishing cap plate or plug **94** closes the opening **95** of arm **21**. Opening **95** permits introduction or removal of screw **70**.

In Figure 13 is shown a modification of the foot rest bearing structure for the middle-placed sockets. In this instance a tubular member **28** cross-connects the outer walls of the two sockets, as in the first case, each end of the tube being welded to the inner wall of a corresponding socket **9**. Each end of the tube **28** receives a bearing cup **99**. The bearing cups are cross-connected by a screw bolt **100** and nut **101**, the bolt being spot welded at one end to one cup and the nut being spot welded on the opposite cup. Within each cup and facing outwardly is spot welded a threaded nut **102**. The foot rest arm **22** is provided with a washer **105** spot welded to it on its inner side as shown. This washer is inserted and centers in the cup **99**, and a headed clamping screw **107** passes through the wall of the arm **22** and through the washer and is threaded into the nut **102** within the corresponding cup. The headed screw **107** is introduced through an opening **95** in the opposite wall of the arm which is afterwards closed by a snap-in cover plate **94**. When the foot rest is rotated the washer and bearing cup are also rotated. Inasmuch as the arc of movement of the foot rest is limited to about three-quarters of a revolution the bolt and thread connection between the cups can never become disconnected as a result of adjusting motions of the arm, although when adjusting occurs the bolt **100** screws in or out of its nut **101**.

In assembling the device the cup **99** carrying the bolt **100** is first inserted in the tube **28**, then the opposite cup is inserted and rotated to thread it onto the end of the bolt, thus securing the two cups.

The assembly of the foot rest into its bearings is accomplished in the manner previously described, with the exception that screw **107** is not used in the first form.

I claim as my invention:

1. A foot rest rotatably mounted and having a toothed member rotatable therewith, a pair of plates, one held stationarily and the other rotatably mounted, slots in the plates registered in pairs, the slots of each pair being angularly related, and pins, one passing through each pair of slots, said slots, pins and teeth thus being so related that rotation of said rotatable plate either causes the pins to engage the teeth to prevent rotation of the member, or causes the pins to be disengaged from said teeth to permit rotation of the member.

2. A foot rest rotatably mounted and having a toothed member rotatable therewith, a pair of plates, one held stationarily and the other rotatably mounted, slots in the plates registered in pairs, the slots of each pair being angularly related, and pins, one passing through each pair of slots, said slots, pins and teeth thus being so related that rotation of said rotatable plate in one direction causes the pins to engage the teeth to prevent rotation of the member and on rotation in the opposite direction causes the pins to be disengaged from said teeth to permit rotation of the member.

3. A foot rest rotatably mounted and having a toothed member rotatable therewith, a pair of plates, one held stationarily and the other ro-

tatably mounted, slots in the plates registered in pairs, the slots of each pair being angularly related, and pins, one passing through each pair of slots, said slots, pins and teeth thus being so related that rotation of said rotatable plate either causes the pins to engage the teeth to prevent rotation of the member, or causes the pins to be disengaged from said teeth to permit rotation of the member, the rotatable plate being rotatable about the axis of rotation of the toothed member, and motion of the pins being radial with reference to said axis.

4. A foot rest rotatably mounted and having a toothed member rotatable therewith, two pairs of plates, one pair arranged at each side of said toothed member, one plate of each pair being held stationarily and the other plate being rotatably mounted, slots in the plates of each pair and registered in pairs, the slots of each pair being angularly related, and pins, one for each pair of slots, each passing through corresponding slots of both pairs of plates, said slots, pins and teeth thus being so related that when the two rotatable plates are simultaneously rotated, the pins are either engaged with the teeth to prevent rotation of the toothed member or are disengaged from said teeth to permit rotation of said toothed member.

5. A foot rest rotatably mounted and having a toothed member rotatable therewith, two pairs of plates, one pair arranged at each side of said toothed member, one plate of each pair being held stationarily and the other plate being rotatably mounted, slots in the plates of each pair and registered in pairs, the slots of each pair being axially related, and pins, one for each pair of slots, each passing through corresponding slots of both pairs of plates, said slots, pins and teeth thus being so related that when the two rotatable plates are rotated, the pins are either engaged with the teeth to prevent rotation of the toothed member or disengaged from said teeth to permit rotation of said toothed member, the rotation of the rotatable plates being about the axis of rotation of the toothed member, and the motion of the pins being radial with reference to that axis, the pins bridging the pairs of plates and having their axes parallel with the axis of rotation of the toothed member.

6. A device of the class described comprising, a casing having a chamber, the wall of the casing having an opening in communication with the chamber, a plate rotatable in the chamber and having an operating handle passing through and oscillatable in the opening and accessible at the outside of the casing, a second plate in the chamber removably held against rotation, a toothed member in the chamber at one side of which said pair of plates is disposed, a second pair of similar plates similarly mounted at the opposite side of the toothed member and in which said toothed member is journaled, means connecting said handles for motion in unison, slots in said plates in register, the slots of the second plate and of the other plates being angularly related, and pins, one passing through corresponding slots of all plates and adapted to move in or out of the path of the teeth, said slots, pins and teeth thus being so related that rotation of said rotatable plates by said handle either causes the pins to engage the teeth to prevent rotation of the toothed member or causes the pins to be disengaged to permit such rotation.

7. A device of the class described comprising, a casing having a chamber, a wall of the chamber having an opening, a plate rotatable in the chamber and having an operating handle passing through and oscillatable in the opening and accessible at the outside of the casing, a second plate in the chamber held against rotation, a toothed member in the chamber at one side of which said pair of plates is disposed, a second pair of similar plates similarly mounted at the opposite side of the toothed member and in which said toothed member is journaled, means connecting said handles for motion in unison, slots in said stationary plates, radial with respect to the axis of rotation of the toothed member, slots in the rotatable plates tangent with respect to a circle generated from said axis as a center, pins, one passing through corresponding slots of all plates and adapted to move in or out of the path of the teeth, when said plates are oscillated by said handles.

8. A device of the class described comprising, a casing having a circular chamber and having radially disposed recesses, the wall of the chamber having an opening in communication with the chamber through one of the recesses, a circular plate in the chamber engaging the wall of the chamber as a bearing and having an operating handle passing through and oscillatable in the opening and accessible at the outside of the casing and removable through the opening after the plate has been moved out of the chamber by motion in an axial direction, a second plate in the chamber removably held against rotation by projections entering said recesses, a toothed member in the chamber at one side of which said pair of plates is disposed, a second pair of similar plates similarly mounted at the opposite side of the toothed member and in which a boss of said toothed member is journaled, means releasably connecting said handles for motion in unison, slots in said plates in register, the slots of the second plate and of the other plates being angularly related, and pins, one passing through corresponding slots of all plates and adapted to move in and out of the path of the teeth, said slots, pins and teeth thus being so related that rotation of said rotatable plates by said handles either causes the pins to engage the teeth to prevent rotation of the toothed member or causes the pins to be disengaged to permit such rotation.

9. A device of the class described comprising, a casing having a chamber, a wall of the chamber having an opening, a plate rotatable in the chamber and having an operating handle passing through and oscillatable in the opening and accessible at the outside of the casing, a second plate in the chamber held against rotation, a toothed member in the chamber at one side of which said pair of plates is disposed, a second pair of similar plates similarly mounted at the opposite side of the toothed member and in which said toothed member is journaled, means connecting said handle projections for motion in unison, slots in said plates in register, the slots of the stationary plates and of the rotatable plates being angularly related, and pins, one passing through corresponding slots of the plates and adapted to move in or out of the path of the teeth when said plates are oscillated by said handles, said toothed member having a socket and said casing having a bearing leading to said socket, a foot rest having two arms, one having a pivoting element passing through said bearing and disposed within the socket, and

means releasably securing said pivoting element for movement in unison with said toothed member, including a screw which is accessible through an opening in the arm which has the pivoting element and from a point between said arms.

10. A foot rest structure having plural means by which it can be mounted for pivotal movement, a mechanism for releasably holding the foot rest structure at any one of a plurality of angular positions, and means releasably coupling one of said plural pivoting means and said mechanism, including a rotatable element having a socket, and means in said socket and on said one of said plural pivoting means, releasably interlocked for movement in unison.

11. A foot rest structure assembly having plural means by which it can be mounted for pivotal movement, a mechanism for releasably holding the foot rest structure at any one of a plurality of angular positions, means releasably coupling one of said plural pivoting means and said mechanism including a screw which is accessible through an opening in a part of said foot rest structure.

12. A foot rest structure assembly comprising a pair of arms connected by a foot piece, each arm having a lateral projection constituting means by which the structure can be mounted for pivotal movement, a mechanism for releasably holding said structure in any one of a plurality of angular positions, and means releasably coupling said mechanism and one of said projections, including a screw which is accessible through an opening in one of said arms from a point between the arms.

13. In combination with a base providing opposed walls, a foot rest structure comprising a pair of arms rigidly connected, each arm having an outwardly extending pivoting projection, one of said projections entering a bearing in one of the walls and being removable from the bearing by motion in an axial direction, a unit mechanism adapted to hold the foot rest structure releasably at any one of a plurality of angular positions and in which the remaining pivoting projection is journaled for release by movement in an axial direction, and means releasably securing said mechanism to the opposite wall, said foot rest structure, bearing, mechanism and walls being so related that on release of said securing means the entire assembly can be swung in a direction transverse to the pivotal axis and about said bearing as a center to bring said mechanism free of said surface, whereafter by motion of the entire assembly in an axial direction the first mentioned bearing projection can be released from its bearing, whereby by a reverse operation the foot rest structure and its adjusting mechanism can be easily and quickly assembled on the base after the mechanism is assembled on the pivoting projection of said foot rest structure.

14. A twin seat structure having four socket members for receiving the lower ends of each of a pair of backs for the seats, one socket member being arranged at each end of the structure and two of the members being adjacently placed at the middle of the long dimension of the structure, a tubular bearing secured to the middle-placed members and traversing the inner wall of each, the outer wall of each middle-placed member having an opening leading into said tubular bearing, a foot rest structure having a pivoting projection passing through one of said openings and pivotally cooperating with said tubular bearing, and means pivotally connecting said foot rest structure to the inner face of one of said end socket members, the relation of said last mentioned pivoting means to the foot rest structure and the relation of the pivoting projection to the tubular bearing being such that after release of said pivoting means, the rest structure can be moved outwardly in a direction transverse to its axis to permit axial movement of said foot rest structure to disengage the pivoting projection from said tubular bearing.

15. A device of the class described including, a casing having a chamber having a cylindrical wall, an opening in said wall, a plate rotatably fitting the cylindrical wall of the chamber having a handle extension passing through said opening to a point outside of the casing, a second plate laid against the first plate, and means to prevent its rotation in said chamber, a toothed member, means journaling it within the casing, slots in the plates registered in pairs, the slots of each pair being angularly related, and a pin passing through each pair of slots, said slots, pins and teeth of said toothed member thus being so related that rotation of said rotatable plate either causes the pins to engage the teeth to prevent rotation by the toothed member or causes the pins to be disengaged by the teeth to permit rotation of the member, and means acting on said handle extension to forcibly automatically bring its plate to and hold it in that position whereat said pins are engaged with the teeth to prevent rotation of said member.

16. A device of the class described including, a casing having a chamber having a cylindrical wall, an opening in said wall, a plate rotatably fitting the cylindrical wall of the chamber having a handle extension passing through said opening to a point outside of the casing, said extension being withdrawable through said opening after moving said plate axially in relation to the chamber, a second plate laid against the first plate, and means to prevent its rotation in said chamber, a toothed member and means journaling it within the casing, slots in the plates registered in pairs, the slots of each pair being angularly related, and a pin passing through each pair of slots, said slots, pins and teeth of said toothed member thus being so related that rotation of said rotatable plate either causes the pins to engage the teeth to prevent rotation by the toothed member or causes the pins to be disengaged by the teeth to permit rotation of said member.

17. A device of the class described including, a casing having a chamber having a cylindrical wall, an opening in said wall, a plate rotatably fitting the cylindrical wall of the chamber having a handle extension passing through said opening to a point outside of the casing, said extension being withdrawable through said opening after moving said plate axially in relation to the chamber, a second plate laid against the first plate and means to prevent its rotation in said chamber, a toothed member journaled in said plates, slots in the plates registered in pairs, the slots of each pair being angularly related, and a pin passing through each pair of slots, said slots, pins and teeth of said toothed member thus being so related that rotation of said rotatable plate either causes the pins to engage the teeth to prevent rotation by the toothed member or causes the pins to be disengaged by the teeth to permit rotation of the member.

18. A device of the class described, comprising a toothed member rotatable in a mounting, a pair

of plates in the mounting adjacent the toothed member, means holding one plate stationary and the other rotatably mounted, slots in the plates registered in pairs, the slots of each pair being angularly related, and pins one passing through each pair of slots and extended to the toothed member, said slots, pins and teeth being so related that rotation of the rotatable plate either causes the pins to engage the teeth to prevent rotation of the toothed member or causes the pins to be disengaged from the teeth of said member to permit its rotation.

19. A device of the class described, comprising a toothed member rotatable in a mounting and having means with which a second rotatable member can be connected to have the two members move in rotative unison and to allow separation of one of the members by motion axially of their axes, a pair of plates in the mounting adjacent the toothed member, means holding one plate stationary and the other rotatably mounted, slots in the plates registered in pairs, the slots of each pair being angularly related, and pins one passing through each pair of slots and extended to the toothed member, said slots, pins and teeth being so related that rotation of the rotatable plate either causes the pins to engage the teeth to prevent rotation of the toothed member or causes the pins to be disengaged from the teeth of said member to permit its rotation.

20. A device of the class described, comprising a toothed member rotatable in a mounting, a second member rotatable in a mounting, means releasably connecting said toothed and second members so that the second member can be disconnected from its mounting and from the toothed member by motion axially of said toothed member, a pair of plates in the mounting adjacent said toothed member, means holding one plate stationary and the other rotatably mounted, slots in the plates registered in pairs, the slots of each pair being angularly related, and pins one passing through each pair of slots and extended to the toothed member, said slots and teeth being so related that rotation of the rotatable plate either causes the pins to engage the teeth to prevent rotation of the toothed member or causes the pins to be disengaged from the teeth of said member to permit its rotation.

21. A device of the class described, comprising a casing having a chamber, a wall of the chamber having an opening, a plate rotatable in the chamber and having an operating handle passing through and oscillatable in the opening and accessible at the outside of the casing, a second plate in the chamber, means holding said second plate against rotation, a toothed member in the chamber at one side of which said pair of plates is disposed, a second pair of similar plates similarly mounted at the opposite side of the toothed member and in which said toothed member is journaled, means connecting said handles for motion in unison, slots in said plates in register, the slots of the stationary plates and of the rotatable plates being angularly related to one another, and pins one passing through corresponding slots of the plates and adapted to move in or out of the path of the teeth when said plates are oscillated by said handles.

22. A device of the class described, comprising a casing having a circular chamber open at one side, the wall of the chamber having an opening, a circular plate in the chamber engaging the wall thereof as a bearing and having an operating handle passing through and oscillatable in the opening the wall and accessible at the outside of the casing and removable through the opening after the plate has been moved out of the open side of the chamber by motion in an axial direction, a second plate in the chamber, means removably holding the second plate against rotation, a toothed member in the chamber at one side of which said pair of plates is disposed, a second pair of similar plates similarly mounted at the opposite side of the toothed member and in which a boss of said toothed member is journaled, means releasably connecting the handles for motion in unison, and means associated with the plates including pins which are caused to move according to the direction of oscillation of the handles either to engage the teeth to prevent rotation of the toothed member or to be disengaged to permit such rotation.

ORVILLE S. CAESAR.