Aug. 3, 1948. P. F. MASUCCI ET AL 2,446,185

SLIDING SEAT SUPPORTING MEANS

Filed May 2, 1945 4 Sheets-Sheet 1

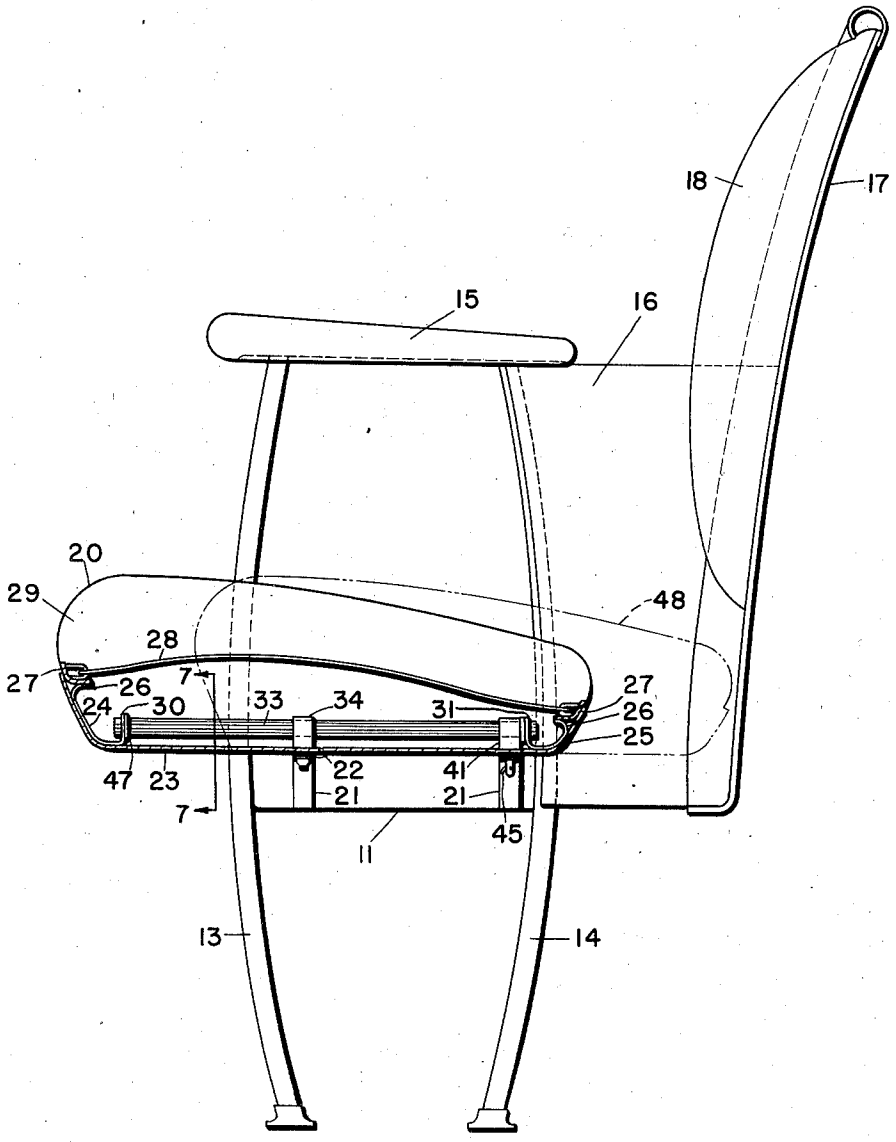


FIG. 1

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Fig. 8.

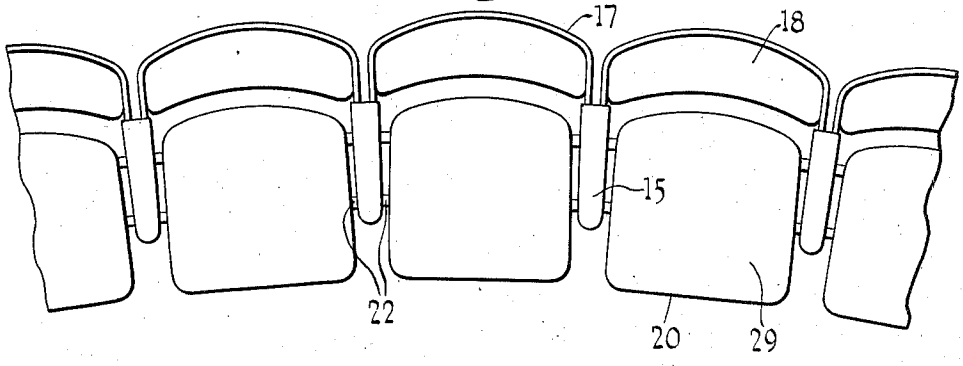


Fig. 2.

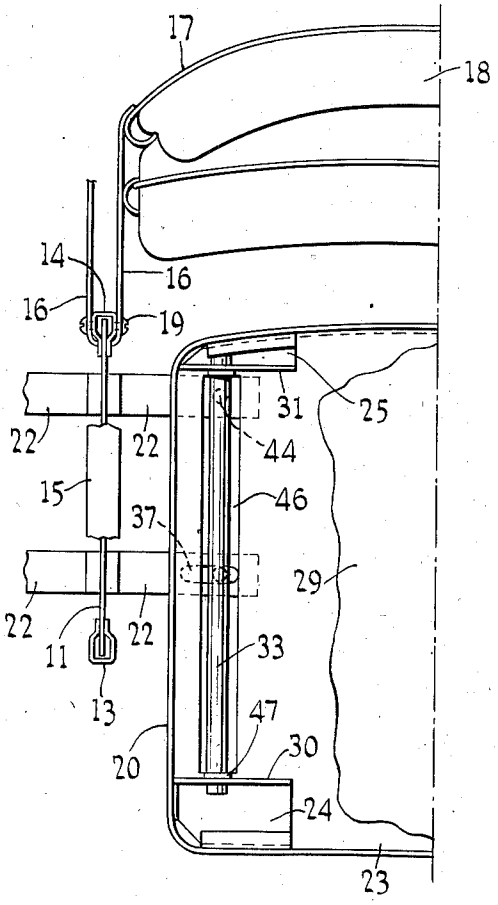
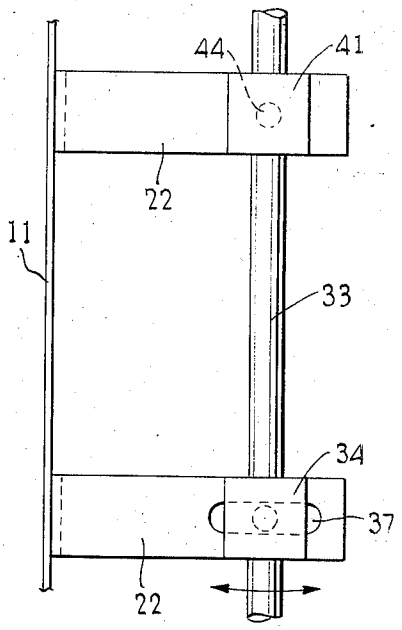


Fig. 2a.



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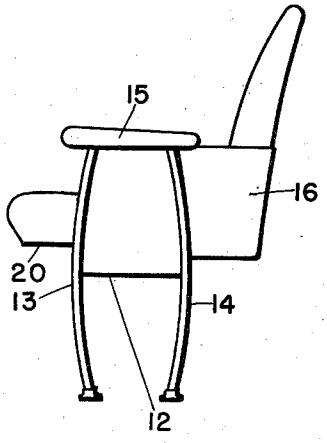


FIG. 3

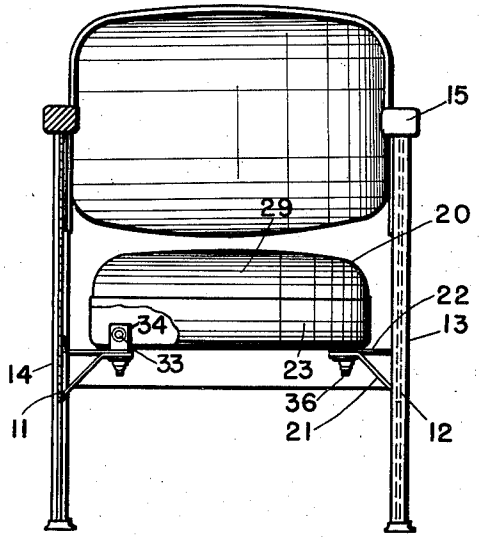


FIG. 4

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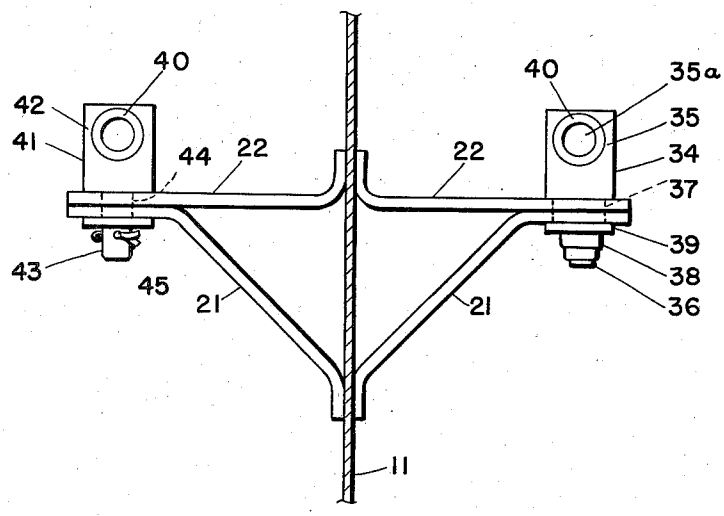


FIG. 5

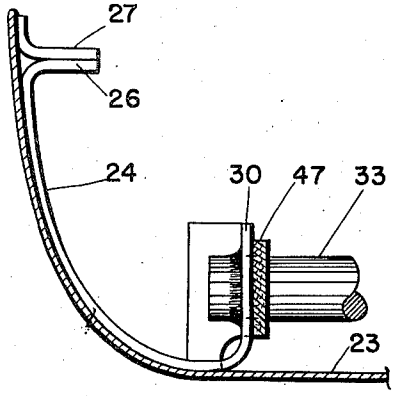


FIG. 6

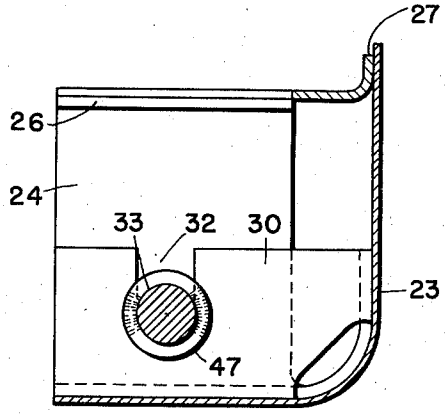


FIG. 7

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UNITED STATES PATENT OFFICE

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SLIDING SEAT SUPPORTING MEANS

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Application May 2, 1945, Serial No. 591,476

7 Claims. (Cl. 155—115)

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This invention relates to a chair for use in theatres and similar places, more particularly it relates to the type of chairs which are set up in rows and have provisions which enable someone occupying the chair to move the seat horizontally forward and backward in order to facilitate passage of another person in front of the person seated on the chair.

An object of the invention is to render the moving mechanism for the seat of such a chair very simple and to make it easy for the seated person to move the seat forward and backward;

A further object of the invention is to make the chair simple and cheap in construction;

Another object is to have in a chair of the type described only few movable parts;

A further object is to render the assembly of the chair as well as repairs or exchange of single parts easy;

A still further object of the invention is to provide, in connection with the movable seat, for simple and effective means to stiffen the single rows of chairs placed one next to the other;

Another object is to arrange, in connection with the movable seat, for means to insure unobstructed movement of the seat in curved rows of chairs, as they are used in theatres, auditoriums and the like;

Another object is to arrange the chair so that a person seated in the row behind the chair is not disturbed through the movement of the seat in front nor able to interfere with such movement.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawings which shall, however, be in no way limitative but merely illustrative.

In the drawings:

Fig. 1 is a vertical center section through a chair according to the invention;

Fig. 2 is a top view of half a chair with parts of the seat removed to show the seat supporting mechanism;

Fig. 2*a* is a top view of two brackets;

Fig. 3 is a side view of the same chair;

Fig. 4 is a front view with some parts broken away;

Fig. 5 is a partial vertical section through a standard common to two adjacent chairs showing a front view of the seat supporting means;

Fig. 6 is an enlarged detail of Fig. 1 showing the front seat support;

Fig. 7 is a rear view of Fig. 6 seen as indicated by line 7—7 of Fig. 1;

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Fig. 8 is a top view of several chairs arranged in a row.

Referring now to the drawings and especially to Fig. 1, the basic structure of the individual chair is formed by standards 11 and 12 which consist each of a single metal sheet cut to the proper shape. At the vertical edges of each standard a bent channel 13 and 14 is attached to the standard as can best be seen from Fig. 2. In Fig. 4 the left side front channel has been removed to show the standard. The channels stiffen the standard, cover its sharp edges and serve also for the floor attachment of the chair which forms, however, no part of this invention. An arm rest 15 is attached to the top edge of each standard which also covers the upper ends of channels 13 and 14.

Fastened to each rear channel 14 by means of screws 19 is a side wing 16 (Fig. 2). A curved metal part 17 which serves as the supporting structure of the chair back is secured to the vertical rear edges of the two wings 16. As can be seen from Fig. 1, part 17 is extended downward beneath the lower edge of the seat described hereafter. Upholstery 18 is secured to the curved metal part 17. The upholstery ends at a distance above the lower edge of part 17. It can be seen from Fig. 2 that within a row of chairs one wing 16 is fastened to each side of each channel 14 whereby each of the two wings belongs to a different one of two adjacent chairs.

Arranged between the two standards and the back of the chair at the proper elevation is the movable seat generally designated with 20. The support for each seat comprises four brackets, two of which are secured to the inside of each standard. Each bracket is formed from two metal strips 21 and 22. Strip 22, as can best be seen from Figs. 4 and 5, is horizontally disposed and secured, for instance welded with its bent up end to one of the standards 11, 12. The free end of strip 22 is supported by strip 21 which is secured with one end to strip 22, bent downwards and outwards under 45 degrees and secured with its other end to standard 11 or 12. Thus the two strips form together a bracket for the firm support of the seat. As shown in Fig. 5, corresponding brackets are arranged on the other side of the standard for the support of the next following seat in the row of chairs. While in the actual chair equal supporting means or brackets are arranged opposite each other on each standard, Fig. 5 shows on the right side a front bracket and on the left side a rear bracket.

Seat 20 itself comprises a metal pan 23 which

forms the main supporting part of the seat proper. Welded into the pan near its four corners are supporting angles **24**, **25** which serve in the embodiment shown with their horizontal upper flanges **26** as supports for a cushion frame **27**. Mounted on the cushion frame are springs **28** of any conventional type which support the seat upholstery **29**. The inside ends of the supporting angles **24**, **25** are bent up to form vertical flanges **30**, **31**. As can best be seen from Figs. 6 and 7 of the drawings, a vertical slot **32** is provided in each of these flanges, each slot opening towards the upper end of the flange and being semi-circular at its bottom end. Each slot **32** accommodates one end of a round guide rod **33** which is welded to the semi-circular bottom end of the slot. From Fig. 1 it can be seen that each of the two rods **33** is supported in one front and one rear angle **24** and **25** respectively so that each rod extends in the direction in which the seat moves, that is substantially parallel to the standards of the chair. Of course, there are many other possibilities for securing the guide rods to the seat pan.

Rods **33** are slidably supported in fittings which are mounted on the brackets described before and best shown in Fig. 2*a*. In the embodiment shown, fitting **34** is mounted on each of the two front brackets. The fitting consists of a square part **35** with a boring **35***a* and a threaded lug **36**. The latter is projecting downward through a slot **37** (Fig 2) in the horizontal strip **22** of each front bracket and held there in position by a nut **38** and washer **39**. The front bracket and fitting are shown on the right hand side of Fig. 5.

The fitting **34** is held in such a position that its boring is disposed in the direction of the seat movement. An oil impregnated bushing **40** is provide in each fitting, the opening of which allows for slidable support of rod **33**. Slot **37** in strip **22** is disposed perpendicular to the direction of rod **33** and allows for a certain amount of lateral adjustment of the fitting. This is important in order to adjust the fitting so that the seat is in the proper position relative to the standards and the back of the chair to assure an undisturbed movement of the seat towards and away from the back of the char. When the chairs are arranged in a curved row it is necessary to arrange the standards so that each consecutive standard is slightly displaced out of its position parallel to the preceding standard. In this case it is of special advantage to provide for means for adjustment of the direction of the guide rods.

Two similar fittings **41** are supported by the horizontal strip **22** of the two rear brackets one of which is shown on the left hand side of Fig. 5. Each fitting **41** comprises again a square upper part **42** equipped with an oil impregnated bushing **40** in which each of the rods **33** is slidably supported. The lug or shaft **43** of fitting **41** has no threads but is rotatably supported in a circular hole **44** of strip **22** (Fig. 2) and secured in the hole by a cotter pin **45** inserted in a boring of the lug. The loose support of fittings **41** makes it possible to adjust guide rods **33** in slots **37** and maintain proper alignment of the front and rear fitting of each guide rod.

A slot **46** is provided in the bottom of the seat pan **23** under and parallel to each of the guide rods (Fig. 2). These slots form the necessary clearance for the fittings **34** and **41** during the fore and aft movement of the seat. A fibre bushing **47** is arranged at each end of each rod **33** close to the supporting angles to form a smooth end stop for the seat movement.

In Fig. 1 the seat is shown in full lines in its forward position. Its rear position is indicated by a dot-dashed line **48**. In the embodiment shown, the seat is adapted to move for about five and one half inches between its extreme forward and rear position which provides for ample space for a person passing in front of the seat.

The operation of the seat is simple and obvious. Through a slight body movement of a person occupying the chair, the seat can be moved forward or backward. When a person is comfortably seated and leans back in the chair, the seat will automatically move into its foremost position. However, when another person wants to pass in front of the chair, the seated person will automatically push the seat back with his body, so that the seat will slide into its rearmost position and will be held there until the seated person relaxes again.

The oil impregnated bushings in which the guide rods are running and the fiber washers at the ends of the guide rods assure smooth, easy and noiseless movement of the seat. The wear of the parts will be negligible and no lubrication or any other attention is required for continuous functioning of the mechanism.

In case of break or wear of a part it is very easy to replace any part or to quickly remove and replace the entire seat by simply taking off nuts **38** and cotter pins **45** and lifting the seat from its supports. The fact that only the seat is movable, without the back of the chair, and that the back of the chair is extended downwards behind the seat, gives the assurance that a person behind the chair cannot be inconvenienced by the moving seat nor can the person move or soil the seat in front with his feet. Fig 1 shows that the seat can freely slide backwards close to the back part **17** due to the fact that the upholstery **18** ends above the upper edge of the rear end of the seat.

Through its simple construction and the avoidance of any link or other complicated moving mechanisms except for the seat itself, the chair according to the invention is far superior to all chairs known up to now which are designed for a similar purpose.

Fig. 8 shows a top view of a number of chairs according to the invention which are combined in a slightly curved row. It can easily be understood from this view that the standards in an adjacent chair cannot be arranged quite parallel to the standards of the neighbouring chair but lie actually on the radii of the curve of the row. In such a case the adjustability of the seat relative to the standards, as described before, is of great advantage.

Though the chair according to the invention is primarily suited for use in a theatre or auditorium, there are many other possible uses for which this chair is adapted. For instance in dining cars or airplanes or in trains or buses where space is limited and two or more seats are arranged side by side, it is always a problem and great inconvenience for a person to pass in front of a seated person. With conventional seats, the seated person has usually to rise in order to let another person pass. With the seat according to the invention, however, the seated person can easily move back and make enough room for the passing person without any inconvenience for either one.

Many alterations and different combinations and modifications are possible within the scope

of the following claims. Especially the construction of the seat proper and the attachment of the supporting means lend themselves to many modifications as long as the basic idea is followed according to which the seat is slidably supported on the standards of the chair.

What we claim is:

1. In a chair comprising two standards, a seat movable forward and backward between said standards, said seat comprising a dish-shaped pan forming the bottom thereof and serving as a support for springs and upholstery, two guide rods rigidly secured to said pan in the direction of the seat movement, said guide rods being positioned in the space between the bottom of said pan and the springs and upholstery, a slot in the bottom of said pan underneath and parallel to each of said guide rods, and supporting means adapted to slidably support said guide rods, each supporting means being attached to one of said standards and extending from said standard to a point beneath said seat and from there upwards through the slot next to the standard to which the supporting means is attached, for slidable engagement with the guide rod located above said slot.

2. In a chair having two standards and a seat supported between said standards and adapted to move forward and backward substantially parallel to said standards, two brackets secured to the inner face of each of said standards, a fitting supported by each of said brackets, a guide rod slidably supported in each of said fittings, said guide rods being secured to said seat, one of said fittings for each guide rod being laterally adjustable on its supporting bracket, the second of said fittings of each guide rod being rotatably supported in its bracket.

3. In a chair having a seat slidable back and forth in a substantially horizontal plane and supported between two standards, the combination of supporting brackets secured opposite each other to the inside surfaces of said standards, sleeve and rod means slidably engaging each other, one of said means being mounted on a part of said seat, the other one being mounted on said brackets, at least one of said means being angularly adjustable in the plane of movement of the seat so as to assure proper movement of said seat substantially parallel to said standards.

4. In a chair having a seat slidable back and forth in a substantially horizontal plane and supported between two standards, the combination of supporting brackets secured opposite each other to the inside surfaces of said standards, sleeve means supported on said brackets, rod means rigidly secured to a part of said seat, said sleeve means being mounted on said brackets for angular adjustment in the plane of movement of the seat so as to assure proper movement of said seat substantially parallel to said standards.

5. In a chair having a seat slidable back and forth in a substantially horizontal plane and supported between two standards, the combination of a pair of front supporting brackets and a pair of rear supporting brackets, one bracket of each pair being secured to the inside surface of one of said standards in opposite relation to the second bracket of said pair on the other one of said standards, sleeve means supported on said brackets, rod means rigidly secured to a part of said seat, said sleeve means being mounted on one of said bracket pairs for rotation about a substantially vertical axis and on the second of said pairs for sidewise adjustment on a line substantially perpendicular to the direction of seat movement so as to effect an angular adjustment in the plane of movement of the seat.

6. In a chair having a seat slidable back and forth in a substantially horizontal plane and supported between two standards, the combination of a pair of front supporting brackets and a pair of rear supporting brackets, one bracket of each pair being secured to the inside surface of one of said standards in opposite relation to the second bracket of said pair on the other one of said standards, sleeve means supported on said brackets, rod means rigidly secured to a part of said seat, said seat comprising a pan shaped supporting bottom having two parallel slots therein extending substantially in the direction of movement of said seat, said rod means being arranged in said seat above and along said slots, said sleeve means being mounted on said brackets and extending upwards through said slots for slidable engagement with said rod means.

7. In a chair having a seat slidable back and forth in a substantially horizontal plane and supported between two standards, the combination of supporting brackets secured opposite each other to the inside surfaces of said standards, sleeve and rod means slidably engaging each other, one of said means being mounted on a part of said seat the other one being mounted on said brackets, at least one of said means being angularly adjustable in the plane of movement of the seat so as to assure proper movement of said seat substantially parallel to said standards, a back rigidly connected with said standards and extending downward beneath the lower edge of said seat and having upholstery secured to part of its front surface, said upholstery extending downward only to approximately the top edge of said seat so as to enable said seat when sliding backwards on said sleeve and rod means to move with its rear end under said upholstery.

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