

Sept. 21, 1965

W. G. AXTELL
CHAIR TIERING CLAMPS

3,207,551

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2 Sheets-Sheet 1

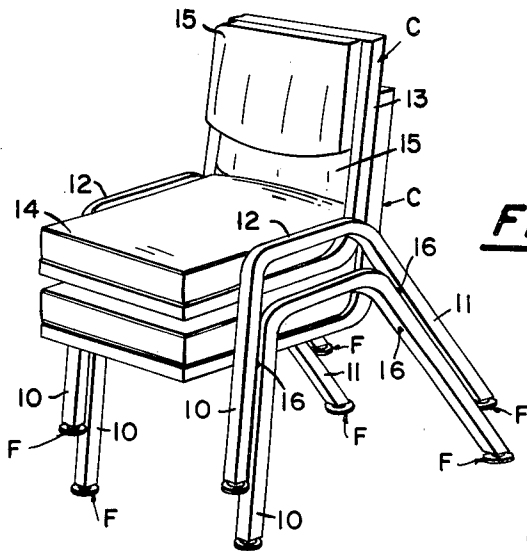


FIG. 1.

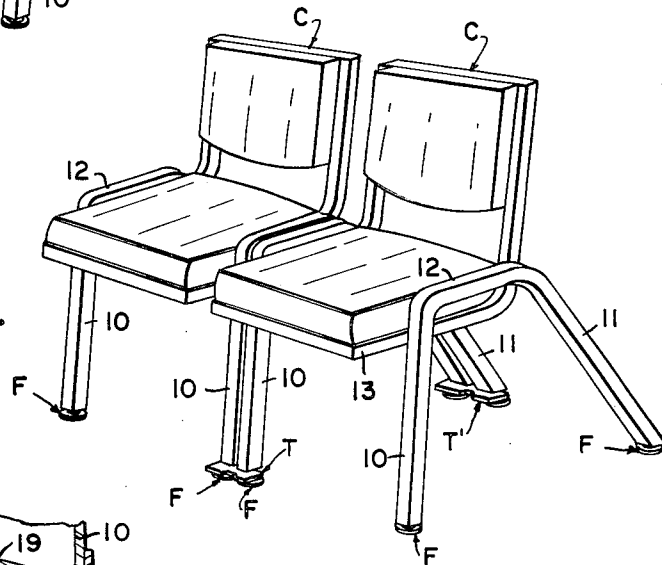


FIG. 2.

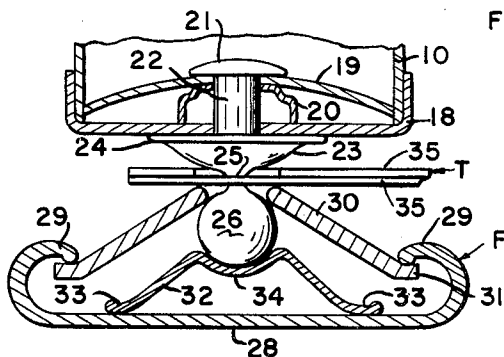


FIG. 3.

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2 Sheets-Sheet 2

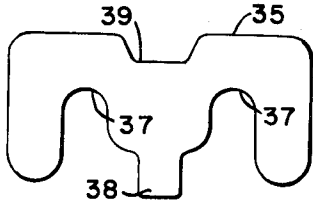


FIG. 4.

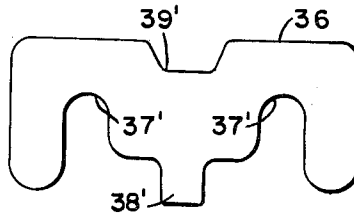


FIG. 5.

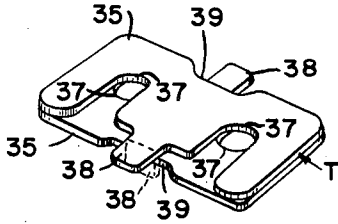


FIG. 6.

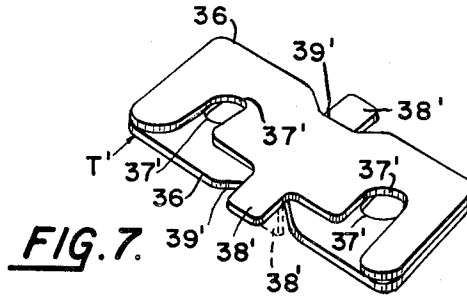


FIG. 7.

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CHAIR TIERING CLAMPS

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This invention relates to tiering clamps, and more particularly to clamps for attaching adjacent chairs together in rows.

Various types of tiering clamps and bars have been provided previously, but these have each had certain inherent disadvantages. Some tiering clamps consist of longitudinal bars extending along the row of chairs, which attach the chairs together in a row but which produce an inconvenient obstruction for the feet of persons sitting in the chairs. Also, the chairs are usually relatively permanently attached to this type of tiering bar so that a given number of chairs, such as four, must be attached to each pair of bars. Thus, the number of chairs on each pair of bars cannot be altered, unless the bar is cut so that it does not extend beyond the ends of the outer chairs. In another type of tiering clamp, a pair of bars connect one chair behind another. This arrangement has the obvious disadvantage that a person moving between the rows of chairs must step over these bars, which extend below the seat of each of the chairs. Also, this arrangement has the same disadvantage as the previous bars, in that a predetermined number of chairs must be attached to the bars or the bars must be cut to a shorter length to accommodate a lesser number of chairs. Another disadvantage of either of the above arrangements is that since the chairs are rigidly attached together, the arrangements in which the chairs may be placed is limited.

Among the objects of this invention are to provide novel tiering clamps; to provide such tiering clamps which attach adjacent chairs together securely in rows and accurately spaced; to provide such tiering clamps which form no obstructions extending along the floor; to provide such tiering clamps which securely clamp together the legs of adjacent chairs; and to provide such tiering clamps which are particularly adapted to be utilized with chairs having legs provided with a reduced portion such as at the lower ends of the legs.

Additional objects and the novel features of this invention will become apparent from the description which follows, taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a front perspective view, showing a pair of stacked chairs of a type particularly adapted to be connected together with the tiering clamps of this invention;

FIG. 2 is a front perspective view of two chairs joined together by a pair of tiering clamps of this invention;

FIG. 3 is a fragmentary vertical section showing the manner in which a tiering clamp of FIG. 2 is attached to the leg of a chair;

FIG. 4 is a top plan view of one plate of a tiering clamp of FIGS. 2 and 3, adapted to interconnect the front legs of adjacent chairs;

FIG. 5 is a top plan view of one plate of a tiering clamp, similar to the tiering clamp of FIG. 4, but adapted to interconnect the rear legs of adjacent chairs;

FIG. 6 is a perspective view of a front tiering clamp, formed by a pair of the plates of FIG. 4, in leg engaging position, showing in dotted lines a tab bent downwardly to prevent the separation of the plates; and

FIG. 7 is a perspective view similar to FIG. 6, but showing a rear tiering clamp, formed by a pair of plates of FIG. 5, in leg engaging position.

In accordance with this invention, two or more chairs, such as chairs C of FIGS. 1 and 2, may be connected

together by novel tiering clamps T and T'. Chairs C have, at each side, tubular front and rear legs 10 and 11, respectively, which are square in cross-section and are conveniently formed integrally with a horizontal seat bar 12. Conveniently, a chair frame 13 formed of tubular members and having a lower forwardly extending seat portion and a rearwardly and upwardly extending back portion, may be attached to the spaced front and rear legs, as by bolts or by welding, and is adapted to support a seat cushion 14 and a back cushion 15. The lower end of each leg 10 and 11 is conveniently provided with a foot F, which is attached to the leg for pivotal movement to permit the foot to conform to the angularity between the chair leg and the floor or other surface upon which the chair is placed. Because the front and rear legs slope forwardly and rearwardly, respectively, the chairs may be stacked, as in FIG. 1, and the legs of one chair are spaced from the legs of the next chair below by bumpers or stops 16, as in FIG. 1, conveniently formed of rubber or plastic and mounted on the underside of the respective front and rear legs, as shown.

As shown in FIG. 3, each leg, such as front leg 10, is provided with a lower end cap 18 which is received over the lower end of leg 10 and is held in place by an arcuate spring 19, which engages the inside of leg 10, adjacent the lower end thereof. Spring 19 is separated from the cap by a central spacer 20 and is held in place by the riveted end 21 of a tube 22 which extends through spacer 20, spring 19 and end cap 18. Tube 22 is integral with an inverted bell 23 having an upper flange 24, in turn integral with a neck 25 and a ball 26, the ball 26 being within foot F and neck 25 forming a pivot point for foot F and also a convenient point of attachment for the tiering clamp T or T'. The ends of spring 19 are adapted to slide easily along the inner surfaces of leg 10 as the cap is placed over the end of the leg, but will engage and dig into leg 10 when an attempt is made to remove the cap, so that it will be held tightly in place and will not slip easily off the end of the leg. Foot F comprises a circular bearing plate 28 having a peripheral, inturned lip 29 which engages the lower edge of a pivot cone 30, the upper end of which engages neck 25. The lower edge of cone 30 is provided with a flange 31 which engages the underside of lip 29 and is held thereagainst by a generally conical spring or swivel support 32, having a peripheral foot 33 and an upper depression 34 for receiving ball 26.

As seen in FIGS. 4-7, tiering clamps T and T' comprise a pair of identical front tiering clamp plates 35, as in FIG. 4, and a pair of rear tiering clamp plates 36, as in FIG. 5, which may be superimposed on each other in reversed position, as in FIGS. 6 and 7, to form the front and rear tiering clamps T and T', respectively. As in FIG. 4, front tiering clamp plate 35 is provided with a pair of spaced slots 37 having semi-circular inner edges, a central, outwardly extending tab 38 disposed between the slots and a notch 39 opposite tab 38. Thus, a pair of plates 35 may be placed in superimposed, reversed position, as in FIG. 6, around the front legs of adjacent chairs, so that neck 25 will be received in the circular hole formed by the inner ends of slots 37 of the superimposed plates 35, as in FIG. 2, and the tab 38 of the upper plate may be bent downwardly into the notch 39 of the lower plate, as shown in dotted lines in FIG. 6, to prevent the plates from becoming separated. Obviously, the tab 38 of the bottom plate may be bent upwardly into notch 39 of the top plate, if desired, also to prevent the plates from becoming separated. Thus, it can be seen it is necessary only to bend the tab of one of the plates and the same result will be obtained no matter which tab is bent. Similarly, clamping plates 36 for the rear legs are provided with a pair of similar spaced slots 37' between which is located a tab 38' with a notch 39' opposite 38'.

It is necessary for rear plates 36 to be wider than front plates 35, because the rear legs of adjacent chairs are spaced further apart than the front legs, since seats 14 are slightly narrower at the rear edge than at the front edge, but plates 36 may be otherwise similar to plates 35. Thus, a pair of plates 36 may be superimposed, as in FIG. 7, and connected between the rear legs of adjacent chairs, as in FIG. 2, while the tab 38' of the upper plate 36 may be bent downwardly, into the notch 39' of the lower plate, as indicated in dotted lines, to prevent the plates from becoming separated. Alternatively, tab 38' of the lower plate may be bent upwardly into notch 39' of the upper plate to prevent separation of the tiering clamp. Thus, it may be seen that tiering clamp plates 35 and 36 may be easily placed around the front and rear legs of adjacent chairs and held in place by merely bending one tab of one of the clamping plates to hold them in position. When it is desired to separate the chairs again, as for stacking, it is merely necessary to bend the tabs back to a horizontal position so that the plates may again be separated. As will be evident, since the tiering clamps T and T' extend between the feet of adjacent chairs, there are no cross bars or other parts extending across the front legs of an individual chair, so that no inconvenience to the user is produced.

The front and rear tiering clamps described above are particularly adapted to hold a series of chairs in a straight row. Thus, the front and rear clamps will accurately space the chairs in the row and maintain them in alignment. However, the chairs may be placed in an arc, by using only the front clamps, since the chairs at each side of the center may be moved forwardly into an arc. As will be evident, the clamps will also accommodate variations in the floor level.

From the foregoing, it is readily apparent that the objects hereinbefore set forth have been fulfilled to a marked degree. Tiering clamps have been provided which will rigidly attach adjacent chairs together by securing the front and rear legs of adjacent chairs together. Also, these tiering clamps provide no obstructions on the floor which will either damage the floor or cause one to stumble when entering the rows of chairs. Furthermore, the clamps are securely fastened to the legs of adjacent chairs, so that the chairs do not move relative to each other and are held in alignment in a row, the front and rear clamps compensating for the normally different spacing between the front and rear legs of adjacent chairs when in a straight row.

Although one embodiment of this invention has been illustrated and described, it will be readily understood that

various changes and variations may be made without departing from the spirit and scope of this invention.

What is claimed is:

1. A tiering clamp, adapted to connect two chairs together in side by side relationship, said chairs having legs provided with a reduced portion, including a pair of flat plates, each flat plate having a pair of spaced, parallel slots extending transversely into said plate from one side edge for receiving a reduced portion of the front or rear legs of adjacent chairs; each said plate being provided with a tab disposed between said slots and a notch opposite said tab adapted to be engaged by the tab of the other plate when the plates are superimposed in reversed overlapping position in engagement with the legs of adjacent chairs and said tab is bent transversely to the plane of the plate, to prevent the plates from separating.

2. A tiering clamp, adapted to connect two chairs together in side by side relationship, said chairs having legs provided with a reduced portion, including a pair of flat plates, each flat plate having a pair of spaced, parallel slots extending transversely into said plate from one side edge for receiving a reduced portion of the front or rear legs of adjacent chairs; each said plate being provided with a tab disposed between said slots and adapted to be bent transversely to the plane of the plate and engage the other edge of the other plate when the plates are superimposed in reversed overlapping position in engagement with the legs of adjacent chairs.

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