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BRACE FOR FURNITURE

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Fig. 1

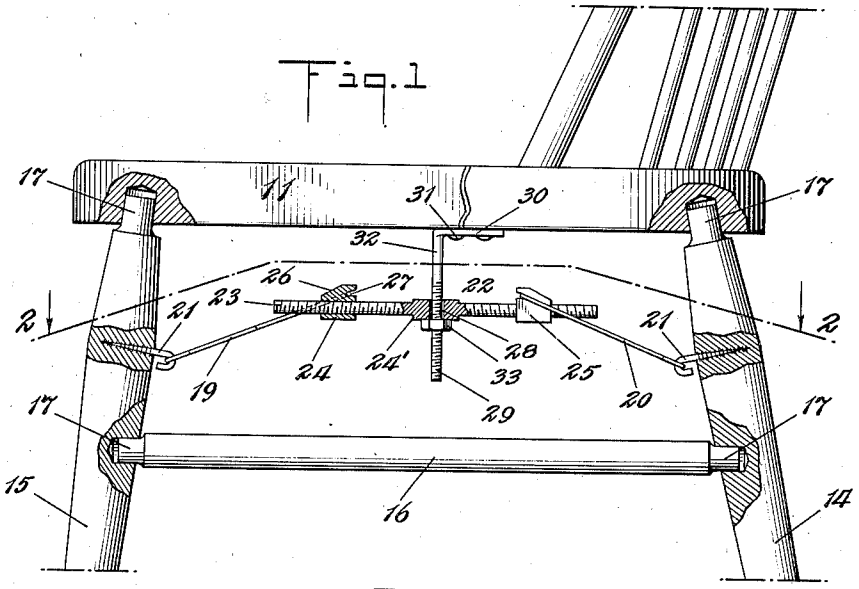
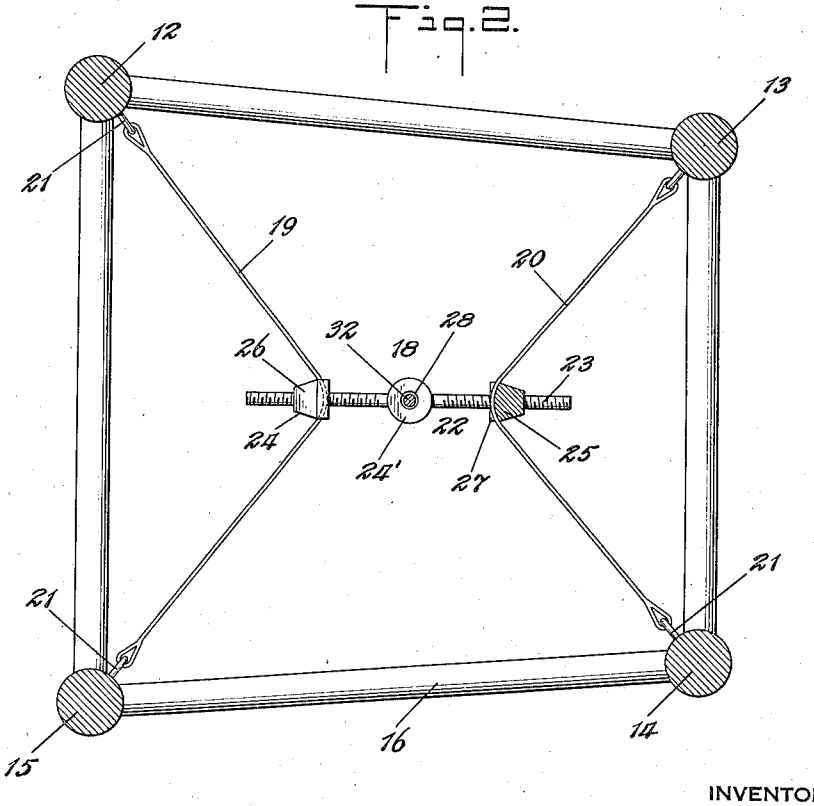


Fig. 2.



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BRACE FOR FURNITURE

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9 Claims. (Cl. 155—197)

The invention relates to a brace for tying together the legs of furniture, such as chairs and tables, and the invention relates to that type of chair braces wherein a pair of U or V-shaped tension wires connect the legs together in pairs and a turnbuckle acts between the wires to draw them together and thus interlock the legs in an X or H-shaped brace.

It has been found in practice that even though the turnbuckle may be rotated to place the requisite tension on the leg-connecting wires, the subsequent use of the chair after several years loosens the initially tight position of the turnbuckle and this occurs even though the pitch of the thread on the turnbuckle screw is low. It is required that braces of this character be cheaply constructed and from an economic standpoint it is not possible to provide a turnbuckle screw with the threads of such low pitch as to avoid or minimize this tendency towards subsequent loosening of the turnbuckle and resulting loss of tension in the wires.

The primary object of the invention is to provide a form of furniture brace of the type above outlined which will be maintained in its initially set position and be thus free of automatic loosening characterizing similar devices not shown.

In certain forms of chairs, tables, and other forms of furniture provided with legs, it is desirable not only to tie the legs together in a horizontal or substantially horizontal plane but such braces act best when the pull on the legs is not only in an inward direction but in an upwardly inclined direction towards the center of the seat of the chair or underside of the table.

Accordingly, another object of the invention is to provide a simplified construction utilizing the advantage of the turnbuckle form of connector between the leg engaging tension wires and at the same time to provide a simplified means for displacing the turnbuckle and associated parts as a whole upwardly so as to give the requisite direction as well as the required tension on the several wires leading to the legs.

Both of these objectives are obtained in a single construction by the utilization of a threaded lock rod which can be secured to the underside of the table top or seat and by passing the lock rod loosely through an eye in the turnbuckle screw rod, the turnbuckle as a whole may be elevated any desired distance and at the same time the engagement of the lock rod in its intrusion through the screw rod will defeat any tendency of this rod to turn out of its initially set position.

Various other objects and advantages of the invention will be in part obvious from an inspection of the accompanying drawing and in part will be more fully set forth in the following particular description of one form of brace embodying the invention, and the invention also consists in certain new and novel features of construction and combination of parts hereinafter set forth and claimed.

In the accompanying drawing:

Fig. 1 is a view in side elevation showing a conventional form of chair equipped with a preferred embodiment of the invention with certain parts shown in section; and

Fig. 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1 looking downwardly on the brace indicated by the arrows and showing one of the nuts in horizontal section.

The chair 10 is provided with a seat 11 and four legs 12, 13, 14 and 15, and associated rungs 16 connecting the legs, each leg engaging both the seat and rungs by socket connections 17.

The brace 18 is formed of two U-shaped tension wires 19 and 20 provided at opposite ends with screws 21 by means of which the brace may be readily attached to the legs and in the illustrated showing wire 19 connects together legs 12 and 15, and wire 20 similarly connects the pair of legs 13 and 14. The wires 19 and 20 are connected at their crotch portion by means of a turnbuckle 22 which includes a screw rod 23 having a flat, disc like portion 23¹ at its midlength and provided on opposite sides thereof with threads in relatively reversed direction. Mounted on opposite ends of the screw rod 23 are nuts 24 and 25, each provided with an upwardly projecting portion 26. Each portion is provided on its inner face with a curved groove 27 in which are slidably mounted respectively the tension wires 19 and 20.

The construction of the nut has the effect of raising the inner, crotch end of the tension wire high above the horizontal plane containing the screw rod 23 thus producing an upward tilt of the wires as shown in Fig. 1. This arrangement tends to minimize binding of the nuts on the screw rod and the more inclined the wires are from the horizontal, the less will be the binding of the nuts on the screw rod. On the other hand when the distance between the wires is shortened and they extend from the slot 27 in a more horizontal direction the nuts become more canted on the screw rod and thus the binding of the nuts on the screw rod becomes positive. Differently expressed, the tension wires hold the nuts from

rotating on the screw rod but the offset pull of the wires tends to rotate the nuts about a self-contained axis perpendicular to the length of the rod and thus tends to resist rotary movement of the rod about its own axis relative to the held nuts. The curved slot 27 is designed to correspond to the natural curve assumed by the crotch of the wire when bent into the angle fixed by the distance apart of the legs and in this way the crotch is permitted to slip or slide through the slot and locate itself automatically in place. This construction also causes the wires to hold the nuts in relatively fixed position while the screw rod is being rotated.

The parts are so arranged that rotating the screw rod 23 by means of a tool inserted in an eye 28 centered in the disc 24[1] causes the nuts 24 and 25 to move towards each other and thus exert tension on the wires 19 and 20. This pull or tension reacts on the legs in a tendency to move them inwardly towards the center of the eye 28 and thus cause the legs to bear towards each other against the several rungs.

There is particularly featured in this disclosure a combined turnbuckle lifting and locking device which comprises an L-shaped lock rod 29, one flange 30 of which is secured to the seat 11 by means of screws 31, and the other portion 32 of which depends from the seat and is extended through the eye 28. It is appreciated that this construction prevents the rotation of the rod 23 after the device has been initially installed in position. The extended lower end of the lock rod is threaded and a lifting nut 33 engages the threaded portion and bears on the underside of the disc 24'. Preferably the nut 33 is advanced upwardly until the portion of each wire 19 and 20 which extends from the turn buckle to its associated leg has the desired degree of angularity over what would otherwise be the horizontal plane in which the wires 19 and 20 are contained. As it is desirable in devices of this character to minimize cost, the tension wires 19 and 20 are of no greater strength than is necessary for the situation involved and, of course, care must be exercised not to place any more tension on these wires than is permitted by their elastic limit. The experienced operator can quickly determine for any given condition what should be the horizontally directed tension obtained by the rotation of the screw rod 23 and what should be the upwardly directed tension controlled by the advancing of the nut 33 to give finally that nicety of pull on the legs which will insure the retention of the legs in their socketed engagement with the seat and in the position in which the legs are intended to be fixed. The present disclosure therefore features the cooperative operation of the screw rod 23 with the turnbuckle lifting or elevating adjustment provided by the lock rod and its associated nut 33. In practice the screw rod will be rotated into position to give a little less than the desired tension on the wires 19 and 20 and then by a more or less micrometrical adjustment of the nut 33 the desired additional tension may be placed on the tension wires.

This inward and upwardly directed pull on each leg will tend to lower the seat and thus cause the upper ends of the legs to more snugly engage in the sockets forming part of the connection at 17. It is further suggested that the flange 30 be utilized as a strap to extend across any joint or crack in the seat in those cases where the seat may be cracked or broken. In the drawing it may be assumed that the strap 30 extends across a blind crack in the seat with the two screws 31 positioned on opposite sides of the crack and engaging the two parts of the seat on opposite sides of the crack. It is also suggested that the lock rod be omitted and dependence placed upon the binding of the nuts in their angled engagement with the screw rod to secure the rod against accidental rerotation.

While there have been shown, described and pointed out in the annexed claims, certain novel features of the invention, it will be understood that various omissions, substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention.

I claim:

1. In a device of the class described, the combination of a chair including a seat and four legs, a bracing device beneath the seat for tying the legs together and to the seat, said brace including two tension wires, each connecting a pair of adjacent legs and a turnbuckle including a screw rod provided midlength with an eye extending therethrough, a pair of nuts oppositely threaded on the rod on opposite sides of the eye, one for each wire and each provided with a groove for receiving its associated wire adjacent the midlength of the latter and a lock rod secured to the underside of the seat, depending therefrom and extending into the eye to prevent accidental rotation of the turnbuckle rod out of its set position placing tension on the wires through the nuts.

2. In combination with an article of furniture comprising a top piece and a plurality of legs, a bracing device for tying the legs to each other and to the top piece, said brace including a pair of tension wires secured to the legs and extending in a generally horizontal direction, a turnbuckle for placing tension on the wires, said turnbuckle including a horizontally extending screw rod provided with an eye and engaging means hooking the wires on opposite sides of the eye, a vertically extending lock rod secured to and depending from the top piece and extending through the eye to prevent the screw from rotating, the extended part of the lock rod being threaded and a nut engaging the threaded lower end of the lock rod, bearing against the underside of the screw rod and in tending to press the screw rod upwardly acting to give the tension rods an inwardly and upwardly directed pull on the legs.

3. In combination with a chair having a seat and four legs, a bracing device for tying the legs together and to the center of the seat, said device including two U-shaped tension wires each having its opposite ends secured to two of the legs below the seat, a turnbuckle engaging between means on the tension wires in a tendency to draw the legs together horizontally and lifting means acting on the turnbuckle in a tendency to elevate the same and thus impose an upwardly and inwardly directed tension on the part of each wire which extends between the turnbuckle and its associated leg.

4. A bracing device for connecting together the legs of a piece of furniture, including a pair of U-shaped tension wires provided at their ends with means for securing them to the legs, a turnbuckle engaging means in the crotch portions of the tension wires and tending to draw them towards each other in one plane and tension means act-

ing on the turnbuckle at a point between the crotch portion of the wires and tending to draw the turnbuckle laterally out of said plane whereby the tension wires are subjected to two forces acting at right angles to each other.

5. As an article of manufacture, a bracing device for connecting the legs of furniture including a turnbuckle comprising a screw rod having an eye extending therethrough and which eye is adapted to receive a tool for rotating the screw rod, a pair of nuts in opposite threaded engagement with the ends of the rod, a pair of tension wires provided with means at opposite ends for engaging a pair of the furniture legs, each nut engaging one of the tension wires at its midlength, and a lock rod provided with means for securing it to the furniture and extended into the eye to prevent rotation of the turnbuckle screw rod after the brace has been installed in place.

6. A bracing device for use in tying together the legs of a piece of furniture including tension wires for connecting together the legs in pairs, a turnbuckle comprising a screw rod having an eye extending therethrough and oppositely threaded on opposite sides of the eye, nuts in threaded engagement with opposite ends of the screw rod and provided with means for engaging the tension wires to draw the same together when the screw rod is rotated in one direction, a lock rod having a threaded end extending through the eye and a nut on the threaded end of the lock rod for engaging the screw rod to shift the same transversely of its length in one direction along the lock rod.

7. A turnbuckle including a screw rod provided midlength with an eye extending therethrough, nuts oppositely threaded on the rod on opposite sides of the eye and provided with means for engaging tension wires, a lock rod provided with a threaded end extending through the eye and a nut on the threaded end engaging the portion of the screw rod outlining the eye to shift the turnbuckle and associated nuts bodily in the direction of the lock rod.

8. A bracing device for tying together the legs of a piece of furniture, comprising a pair of U-shaped tension wires for connecting the legs in pairs, screw means connecting the wires adjacent their midlengths for drawing the wires horizontally towards each other in one direction and other screw means acting upwardly at right angles to the first named screw means and coacting therewith to cause the wires to assume a position resulting from the drawing action of said two means.

9. A device for tying together the legs of a chair and for tying together two parts of the seat, comprising a pair of U-shaped tension wires, a turnbuckle engaging means for drawing the wires together and provided with an eye, an L-shaped rod having one part threaded and extended into the eye and having another part constituting a strap adapted to extend across the joint between the two parts of the seat to secure the parts together and a nut engaging the threaded part of the rod and acting to elevate the turnbuckle to place tension on the tension wires.

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