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[54] **LOCKABLE FOLDING BRACE SYSTEM**  
 4 Claims, 7 Drawing Figs.

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 B65d 43/24, B25g 3/38

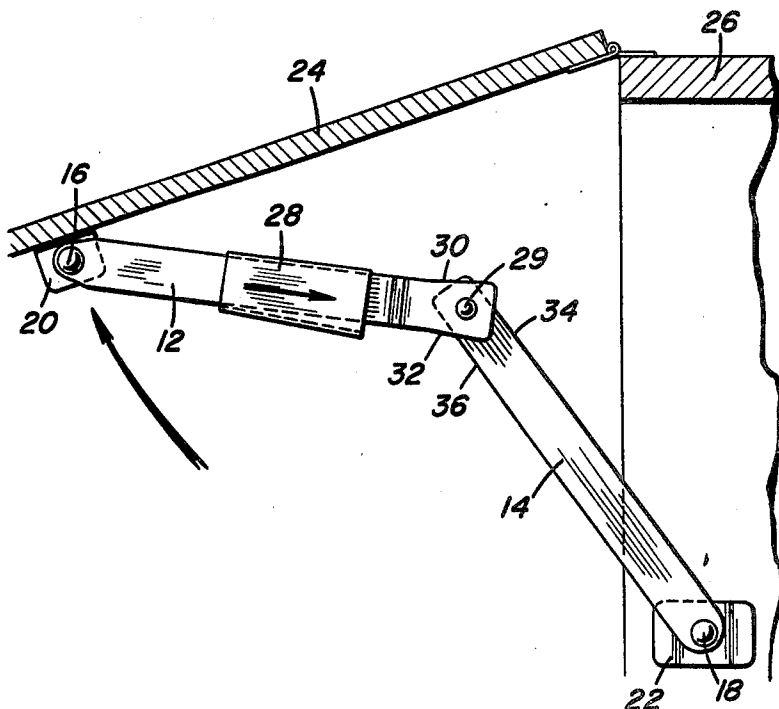
[50] Field of Search..... 292/262,  
 263; 287/98; 217/60 (E); 108/129, 131, 80, 81;  
 285/421; 248/240.4

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**ABSTRACT:** A lockable brace linkage system is disclosed for supporting a hinged structure in an opened condition. A jointed linkage is arranged to open from a folded condition to colinearity. The median joint is locked with a tapered sliding sleeve which moves over the common joined ends of the linkage. These ends are tapered in width, one inwardly and one outwardly, to facilitate the movement of the sleeve thereover and seat with wedge action. Another embodiment of the invention useful where the lock sleeve is too light weight to slide positively, incorporates a spring bias which assists the movement of the sleeve to the lock position and also tends to maintain the linkage in the folded position.



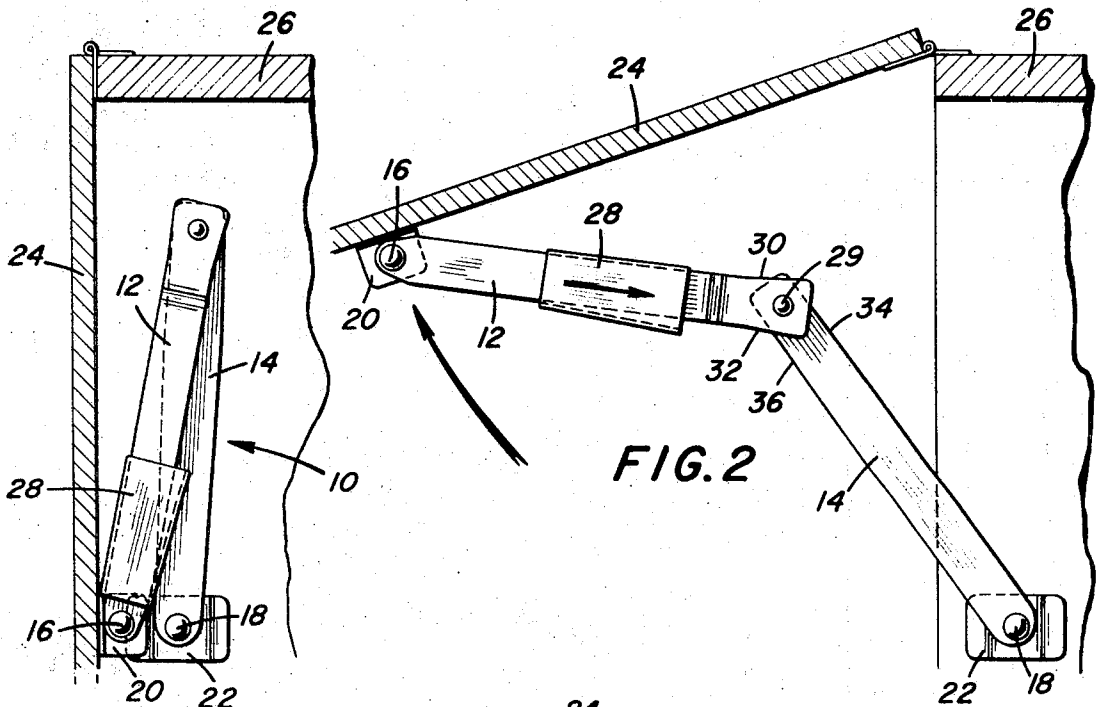


FIG. 1

FIG. 2

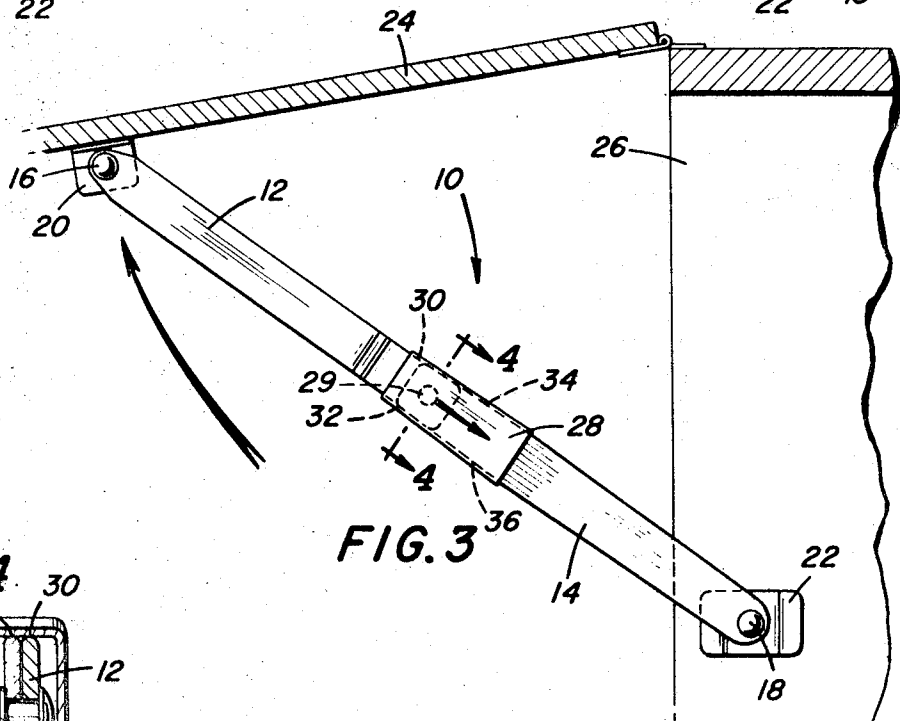


FIG. 3

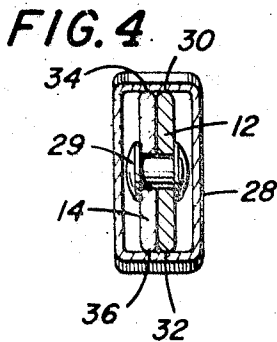


FIG. 4

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**LOCKABLE FOLDING BRACE SYSTEM**

This invention relates generally to braces, and more particularly it pertains to a foldable linkage brace having a safety lock.

Overcenter and detented linkage locks for folding arm braces are well known in the art but they have the disadvantage that they can be inadvertently released with the consequent collapse of the supported structure.

It is a principal object of this invention to provide a lockable hinged brace which is positive in action and which cannot be accidentally released.

Another object of this invention is to provide a simple lock for jointed linkage which is self-tightening with wedge action to more securely immobilize the joint.

Still another object of the invention is to provide a lock bias arrangement for foldable linkage which features a positive movement of a light weight lock element into lock position and additionally serves to retain the folded condition of the linkage.

Yet another object of the invention is to provide a lockable linkage brace of a minimum of parts which can be manufactured with simple tooling in either heavy or lightweight construction as an inexpensive article of trade.

Other objects and attendant advantages of the invention will become more readily apparent and understood from the following detailed specification and accompanying drawings in which:

FIGS. 1, 2, and 3 are side views of one embodiment of an improved brace of this invention in folded, partially open, and fully opened conditions, respectively;

FIG. 4 is a cross section view taken on lines 4-4 of FIG. 3;

FIG. 5 and 6 are side views of another embodiment of the invention of an improved brace showing, respectively, the folded and the fully opened and locked conditions; and

FIG. 7 is longitudinal section taken on line 7-7\*\* of FIG. 6.

The reference numeral 10 indicates generally a folding brace embodying features of this invention. As shown in FIGS. 1, 2, 3, and 4, this brace 10 comprises a linkage of two flat elongated arms 12, and 14. The upper arm 12 is attached at its upper end to a bracket 20 with a pivot 16 which may be a loose rivet. The lower arm 14 of somewhat greater width is attached at its lower end to a bracket 22 with a similar pivot 18. The bracket 20 is secured to a table leaf or a box top 24, which is hinged to table or box structure 26.

It is to be pointed out that although this brace 10 is shown in conjunction with a table leaf 24 and a table 26, the brace 10 can be used with other types of structures, such as a table and table legs, or any type of structure where a structure is to be hinged in an opened condition.

The bracket 22 is attached to this structure 26 so that when the linkage comprising arms 12 and 14 is folded upon itself as shown in FIG. 1, the table leaf or box top 24 is closed and when fully extended the arms 12 and 14 are in a common center line and the leaf or box top 24 held open as shown in FIG. 3.

A hollow, tapered, rectangular sliding sleeve 28 is provided upon the upper arm 12 and this sleeve moves by gravity as shown in FIG. 2 in the direction of the straight arrow over the common lapped linkage joint 29 as shown in FIG. 3. The lower end 30 of the upper arm 12 has a lateral expansion taper 32 while the upper end 34 of the lower arm 14 has a lateral reduction taper 36.

These tapers 32 and 36 are proportioned to receive the sliding sleeve 28 with a wedging action and hold it about upon the

joint 29 to immobilize it as shown best in FIG. 4. Economically, this joint 29 may also be a loose rivet as in the case of pivots 16 and 18. When the arms 12 and 14 are to be folded, the sleeve 28 is manually retracted from the joint 29 and the linkage 12, 14 is collapsed upon itself.

The movement of the sleeve 28 to a lock position may be made more positive by a modification of the folding brace as shown in FIGS. 5, 6 and 7. This is especially useful where a hinged lid 38 and box 40 are of lightweight construction such as for toys and where the sliding sleeve 42 is of thin material of low mass. If the parts are of heavyweight construction, such as a tool box, this embodiment of the brace can still be utilized by constructing the parts thereof of the required strength and material.

Here, the sliding sleeve 42 differs from the sleeve 26 previously described in having one end of a tension coiled spring 54 attached to it with an anchor post 48. The other end of the spring 44 is hooked to an anchor post 46 on the lower end of the lower arm 14. When the lid 38 is moved upwardly as indicated by the curved arrow of FIG. 6, the arms 12 and 14 move into coalignment and the spring 44 pulls the sleeve 42 over the linkage joint 29 and tends to retain it there even if the box 40 is inverted. To fold the brace to an inoperative position, a force must be applied counter to the bias of spring 44.

When the lid 38 is down as shown in FIG. 5, the bias of spring 44 is advantageously employed to hold the folded arms 12 and 14 proximate and more positively close the lid 38 upon the box 40.

If desired the spring 44 may be used in plurality as shown in FIG. 7, one spring 44 on each side of the sleeve 42 and arm 14.

Obviously many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

I claim:

1. A lockable folding brace system, comprising, a folding support brace flat arm linkage having first and second arms with a pivotal common lap joint, and a rectangular tapered gravity operable slidable sleeve on one of said first and second arms, said first and second arms having width-tapers at their common lap joint proportioned to receive said tapered sleeve, whereby when said first and second arms are colinearly positioned from a folded condition, said tapered sleeve is operable to slide over the common joined ends of said arms by gravity to lock the common lap joint between said arms.

2. A lockable folding brace system as recited in claim 1, wherein the end of one of said first and second arms is tapered in width on both sides of the pivot of said joint and wherein the end of the other of said first and second arms is correspondingly tapered in width on both sides of the pivot of said joint to facilitate the movement of said slidable sleeve thereover to seat with a wedging action along the overlap on both sides of the pivot of said joint.

3. A lockable folding brace system as recited in claim 1, wherein said slidable sleeve is on said first arm, and additionally tension bias means extending between said tapered sleeve and said second arm for thereby urging said sleeve over said common lap joint in the extended condition of said linkage and for thereby urging said first and second arms toward a proximate position in the folded condition.

4. A lockable folding brace system as recited in claim 3, wherein said tension bias means is provided on opposite sides of said tapered sleeve and extending to said second arm.