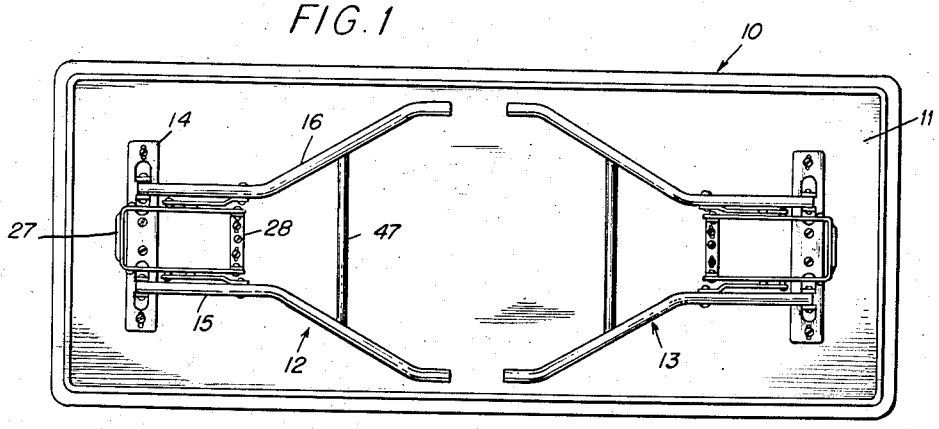
April 14, 1959 J. D. EVES ET AL 2,882,109

FOLDING LOCK BRACE STRUCTURE

Filed Aug. 16, 1956

FIG. 1



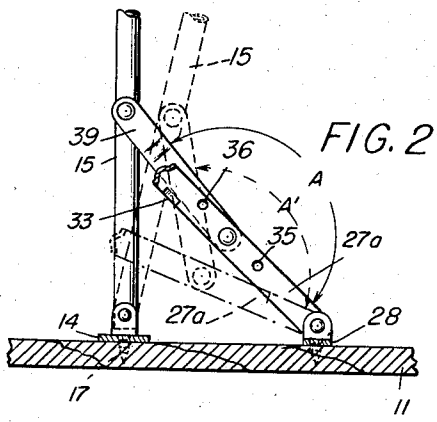


FIG. 2

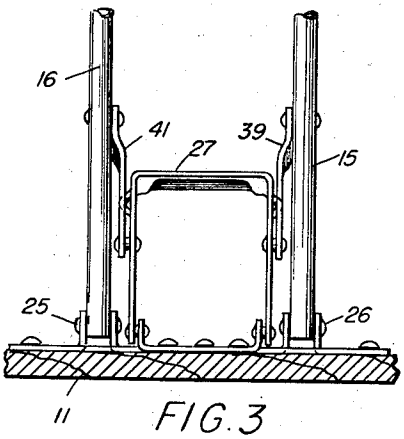


FIG. 3

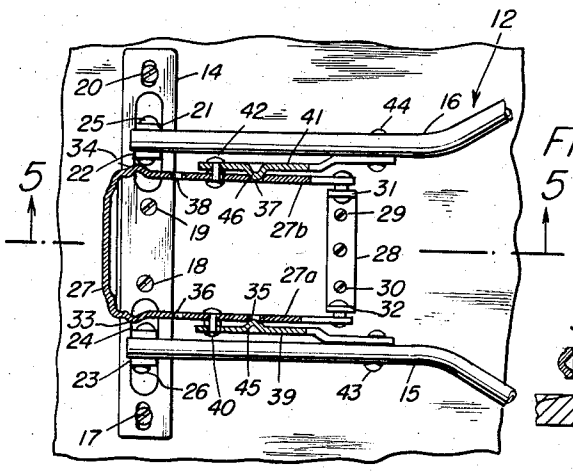


FIG. 4

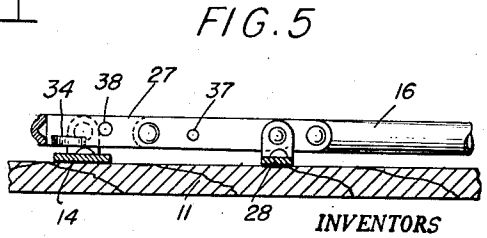


FIG. 5

INVENTORS
JOHN D. EVES
ARTHUR W. OLANDS
By Kane Dalsimer and Kane
ATTORNEYS

United States Patent Office 2,882,109
Patented Apr. 14, 1959

2,882,109

FOLDING LOCK BRACE STRUCTURE

John D. Eves, Cortland, and Arthur W. Olands, Cuyler, N.Y., assignors to The Brewer-Titchener Corporation, Cortland, N.Y., a corporation of New York

Application August 16, 1956, Serial No. 604,569

3 Claims. (Cl. 311—86)

This invention relates generally to structures for supporting tables and the like and more particularly to a folding lock brace structure.

It is often desirable to have available a table or the like which requires little storage space, yet will, when in use, be sufficiently strong so as to support items placed thereon. Because of this, various types of folding lock brace structures have come into use. These structures find particular use where it is necessary that the item be stored away before and after a particular event.

Thus, in some dwellings, it is desirable that tables, stands, stepladders, platforms, choral or music risers or the like be available for certain occasions which can be stored in a small space such as a closet, cellar, attic or the like between these occasions. Also, when the item to be supported by the folding lock brace structure is a table or the like it may be used in places where large gatherings of people occur so that the tables may be made available to those in attendance and stored away later. Also many organizations sponsor or take part in outdoor events which require folding tables or the like to be placed in a field or other area until the event is concluded and then the tables are moved indoors or stored away.

The invention herein disclosed has, as its principal object, the furnishing of a new folding lock brace structure which is rigid throughout and which can be easily folded beneath the surface of the item to be supported or unfolded to support the item.

Another object of this invention is to provide a folding lock brace structure which can be locked into open position against unintentional folding and also which when folded can be locked into position against unintentional opening.

A further object of this invention is to provide a folding lock brace structure which has supports which are fastened to the item to be supported so that weight on the item is evenly distributed among the supports because of the manner in which the lock brace structure is mounted to the item which is to be supported.

Another object of this invention is the provision of a folding lock brace structure having support pairs which are foldable as a unit.

Another object of this invention is to provide a folding lock brace structure which is light in weight and inexpensive to manufacture.

This invention is described and shown herein as a folding lock brace structure used in connection with a folding pedestal table. However, the inventive concept herein presented comprehends an improved lock brace structure having many applications in addition to use in connection with a folding pedestal table. Among these applications are: As a support bracket for folding shelves; as a locking device for legs of stands, platforms, choral or music risers and as a locking device for stepladders and the like.

A folding pedestal table embodying this invention and

the manner of using the same is described herein with reference to the drawings in which:

Fig. 1 is a bottom plan view of a folding pedestal table with a folding lock brace structure constructed in accordance with the teachings of this invention showing the legs in folded position;

Fig. 2 is a partially sectional side view of the table which is shown in Fig. 1 only in inverted position and showing in detail a leg attached to the table top;

Fig. 3 is a partially sectional end view of the table which is shown in Fig. 1 only in inverted position and showing in detail a leg attached to the table top;

Fig. 4 is a partially sectional bottom view of the table shown in Fig. 1 illustrating in detail a leg connected to the table top and

Fig. 5 is a partially sectional view taken on the drawing shown in Fig. 5 along the line 5—5 in the direction of the arrows.

Folding pedestal table **10** which is shown in the drawings has a top **11** which can be of any shape or configuration although it is shown as a rectangular member. This top is maintained above an underlying surface by means of folding pedestals **12** and **13**.

Folding pedestal **12** is attached to top **11** by means of leg plate **14** which is seen best in Fig. 4. Leg plate **14** is a single rectangular metal mounting plate which connects both legs or supports **15** and **16** of folding pedestal **12** in position on the underside of table top **11**. Leg plate **14** is fastened to the underside of table top **11** by means of screws **17**, **18**, **19** and **20** which pass through holes provided in the leg plate, or other suitable attaching means.

Ears **21** and **22** which are pierced out of leg plate **14** near one of its ends and ears **23** and **24** which are pierced out at the other end of leg plate **14** extend perpendicularly to leg plate **14** and table top **11**. It is noted that in the figures ears **21** and **22** are between screws **19** and **20** while ears **23** and **24** are between screws **17** and **18**, however other attaching means may be used and then the ears may not fall between screws.

Ears **21** and **22** support horizontal member **25** which acts as a pivotal connection for leg or support **16**. Likewise leg or support **15** is pivotally connected to leg plate **14** by means of horizontal member **26** which is supported by ears **23** and **24**. As seen in the figures, legs or supports **15** and **16** are therefore each hingedly connected at an end to table top **11**.

Member **27** which is a U-shaped channel is also pivotally connected to table top **11**. Plate **28** which connects member **27** to table top **11** is a rectangular metal plate and is fastened to table top **11** in spaced relationship with plate **14** and parallel thereto. Plate **28** is fastened to table top **11** by screws **29** and **30** which extend through holes formed in the plate, or any other attaching means, and has each of its ends turned away from table top **11** to form a right angle with the table top. Thus, end portion **31** and end portion **32** both extend perpendicular to table top **11**. Channel member **27** is pivotally connected at one of its ends to end portion **31** of plate **28** and the other end of channel member **27** is pivotally connected to end portion **32**.

Channel member **27** has ledges **33** and **34** formed thereon, and both ledges extend outwardly from the center of the channel member on a side thereof. Ledge **33** is seen in Fig. 2 extending from side **27***a* of channel member **27** perpendicularly to the side.

Circular openings **35** and **36** are formed in side **27***a* in spaced relationship from one another and circular openings **37** and **38** are formed in side **27***b* of channel member **27**. Opening **37** is opposite opening **35** while opening **38** is opposite opening **36**. It is noted that

openings 38 and 36 are slightly "off center" each being closer to the edge of the channel side in which it is located. Thus, when channel member 27 is adjacent the underlying surface of top 11 openings 38 and 36 are further from top 11 than openings 37 and 35. The purpose and use of these openings will be seen below when the method of folding and unfolding the table is considered.

Link 39 is pivotally connected at 40 to side 27*a* and link 41 is pivotally connected at 42 to side 27*b*. Connection 40 lies between openings 35 and 36 in side 27*a* and connection 42 lies between openings 37 and 38 in side 27*b*.

The remaining end of link 39 is pivotally connected to leg 15 at connection 43 while the other end of link 41 is pivotally connected to leg 16 at connection 44. Thus, it is seen that link 39 and link 41 connect channel member 27 to legs or supports 15 and 16.

In Fig. 4 of the drawings, legs or supports 15 and 16 are shown in their folded condition. Detent 45 formed in link 39 extends into opening 35 while detent 46 which is formed in link 41 extends into opening 37. The extensions of these detents into the circular openings forms a locking means whereby the legs, as shown in Fig. 4, are locked and maintained in folded position adjacent the underlying surface of table top 11.

Figs. 2 and 3 show the position of the channel member and the links when legs or supports 15 and 16 are in unfolded condition. Here, it is seen that in the unfolded condition, detent 45 extends into opening 36 while detent 46 extends into opening 38, thereby locking the legs or supports in open position.

It is noted that when pedestal 12 is in the open condition, that is, when legs or supports 15 and 16 lie perpendicular to the underlying surface of table top 11, ledge 33 maintains link 39 at an angle with side 27*a* of channel members 27. This angle is designated in the figures as A and is an angle of slightly less than 180°. Also ledge 34 maintains link 41 at an angle with side 27*b* of channel member 27 which is equal to angle A.

The provision of an angle such as A between channel member 27 and the links is an important feature of my invention since it enables the legs or supports to automatically lock into position when the legs or supports are unfolded. The manner in which pedestal 12 may be brought from a folded to an unfolded condition will be considered and particular reference should be had to Fig. 4 which illustrates the position of the linking arrangement when pedestal 12 is in the folded condition and also Fig. 2 which illustrates the position of the linking arrangement when pedesal 12 is in the unfolded condition.

As shown in Fig. 4 when pedestal 12 is in the unfolded condition, legs or supports 15 and 16 are adjacent the underlying surface of table top 11. Links 39 and 41 together with channel member 27 also lie adjacent top 11 and detents 45 and 46 lie in circular openings 35 and 37 respectively. Ledges 33 and 34 lie adjacent leg plate 14.

In order to bring pedestal 12 from a folded to an unfolded condition, an operator may grasp any lower leg or support extremity or cross-brace 47 and pull it away from the underlying surface of table 11. This action will remove detents 45 and 46 from openings 35 and 37 as legs or supports 15 and 16 pivot counterclockwise about connections 26 and 25 as seen in Fig. 2. Channel member 27 pivots clockwise about connections 31 and 32 causing links 39 and 41 to rotate counterclockwise about connections 40 and 42 through the position shown in dotted lines in Fig. 2 where link 39 and channel side 27*a* form angle A'.

Continuing the motion causes legs or supports 14 and 16 to continue to pivot about connections 23 and 21 causing the angle to gradually increase until legs or supports 15 and 16 stand perpendicular to the underlying surface of table 11 and angle A is formed by link 39 and side 27*a*. It is noted that in this condition detent 45 is in opening 36 while detent 46 is in opening 38 and ledge 33 has served as a stoppage preventing further movement of the linking members and preventing the linkages from traveling fully to the dead center position.

Thus, it is seen that when pedestal 12 is swung open rapidly there is a component of thrust which causes legs or supports 15 and 16 to automatically lodge in the open position. This is an important feature of my invention since without this feature, it is necessary to open the legs or supports in two steps; the first step being the rotation of the legs or supports to an unfolded position and the second step being the manual forcing of the links into a locked position. By having angle A less than 180° it is possible to swing the legs or supports from an unfolded position to a folded position where they are locked automatically and with the same motion.

In order to return pedestal 12 to an unfolded position an operator merely applies pressure to the base portion of channel member 27 and presses toward table top 11. This rotates legs or supports 15 and 16 in a clockwise direction about connections 25 and 26. Links 39 and 41 will then rotate clockwise about connections 42 and 40 while channel member 27 rotates counterclockwise about connections 31 and 32. Legs or supports 15 and 16 are continually rotated in this direction until they are adjacent the underlying surface of top 11 as shown in Figs. 4 and 5 where they are locked into this unfolded condition with detent 45 in circular opening 35 and detent 46 in circular opening 37.

The use of single mounting plate 14 to hold both legs or supports as a unit also represents an improvement over the prior art. By studying the figures, it is seen that each leg or support has double support since it is connected to plate 14 by means of two ears. In addition, using single plate 14 and cross-brace 47 provides for better load distribution and increased strength as well as positive positioning during assembly.

Thus, among others, the several objects of the invention as specifically aforenoted are achieved. Obviously, numerous changes in construction and rearrangement of parts might be resorted to without departing from the spirit of the invention as defined by the claims.

We claim:

1. A folding lock brace structure for legs of a folding table comprising in combination a pair of legs each pivotally connected at an end to the underlying surface of the folding table, a U-shaped resilient bracket pivotally connected at its ends to the underlying surface of the folding table in spaced relation with said legs, a pair of identical links each pivotally connected at one end to a side of said bracket and at the other end to one of said legs, an inwardly extending detent formed in each of said links, each of the sides of said U-bracket formed with a recess into which the detents are releasably urged by the resiliency of said bracket to maintain said legs perpendicular to said underlying surface and prevent said links from going to the dead center position and a cross brace rigidly connecting the remaining ends of said legs.

2. A folding lock brace structure for legs of a folding table comprising in combination a pair of legs each pivotally connected at an end to the underlying surface of the folding table, a U-shaped resilient bracket pivotally connected at its ends to the underlying surface of the folding table in spaced relation with said legs, a pair of identical links each pivotally connected at one end to a side of said bracket and at the other end to one of said legs, an inwardly extending detent formed in each of said links, said U-shaped bracket being formed with two recesses in each of its sides which are spaced from one another and from the connection of said link with the side of said bracket, the first of said recesses to cooperate with the detent in the adjacent link and receive the same due to the resiliency of said U-bracket to maintain said legs perpendicular to said underlying surface and prevent said

links from going to the dead center position, the second of said recesses being formed to cooperate with the detent in the adjacent link and receive the same due to the resiliency of said U-bracket to maintain said legs adjacent said underlying surface and a rigid cross brace member connected at either end to the remaining ends of said legs.

3. A folding lock brace structure for legs of a folding table including in combination a mounting plate rigidly fastened to the underlying surface of the folding table, a pair of legs, pivotal connections of an end of each of said legs to said mounting bracket, a U-shaped resilient bracket, second pivotal connections of each of the ends of said U-shaped bracket to the underlying surface of the folding table, said second pivotal connections being spaced from and parallel with said first pivotal connections, a pair of identical links each pivotally connected at one end to a side of said bracket and at the other end to one of said legs, an inwardly extending detent formed in each of said links, each of the sides of said U-bracket formed with a

recess into which the detents are releasably urged by the resiliency of said bracket to hold the legs in opened position and a rigid cross brace connecting the remaining ends of said legs.

References Cited in the file of this patent

UNITED STATES PATENTS

1,788,102	Gilbert	Jan. 6, 1931
1,955,151	Shwayder	Apr. 17, 1934
2,148,823	Lapeyre	Feb. 28, 1939
2,256,889	Blink	Sept. 23, 1941
2,278,810	Virtue et al.	Apr. 7, 1942
2,343,537	De Saussure	Mar. 7, 1944
2,448,360	De Saussure	Aug. 31, 1948
2,665,181	Pucci	Jan. 5, 1954

FOREIGN PATENTS

577,379	Great Britain	May 15, 1946