Feb. 13, 1968 B. COHEN 3,368,504

LOCKING MECHANISM FOR FOLDABLE TABLES

Filed June 28, 1967 3 Sheets-Sheet 1

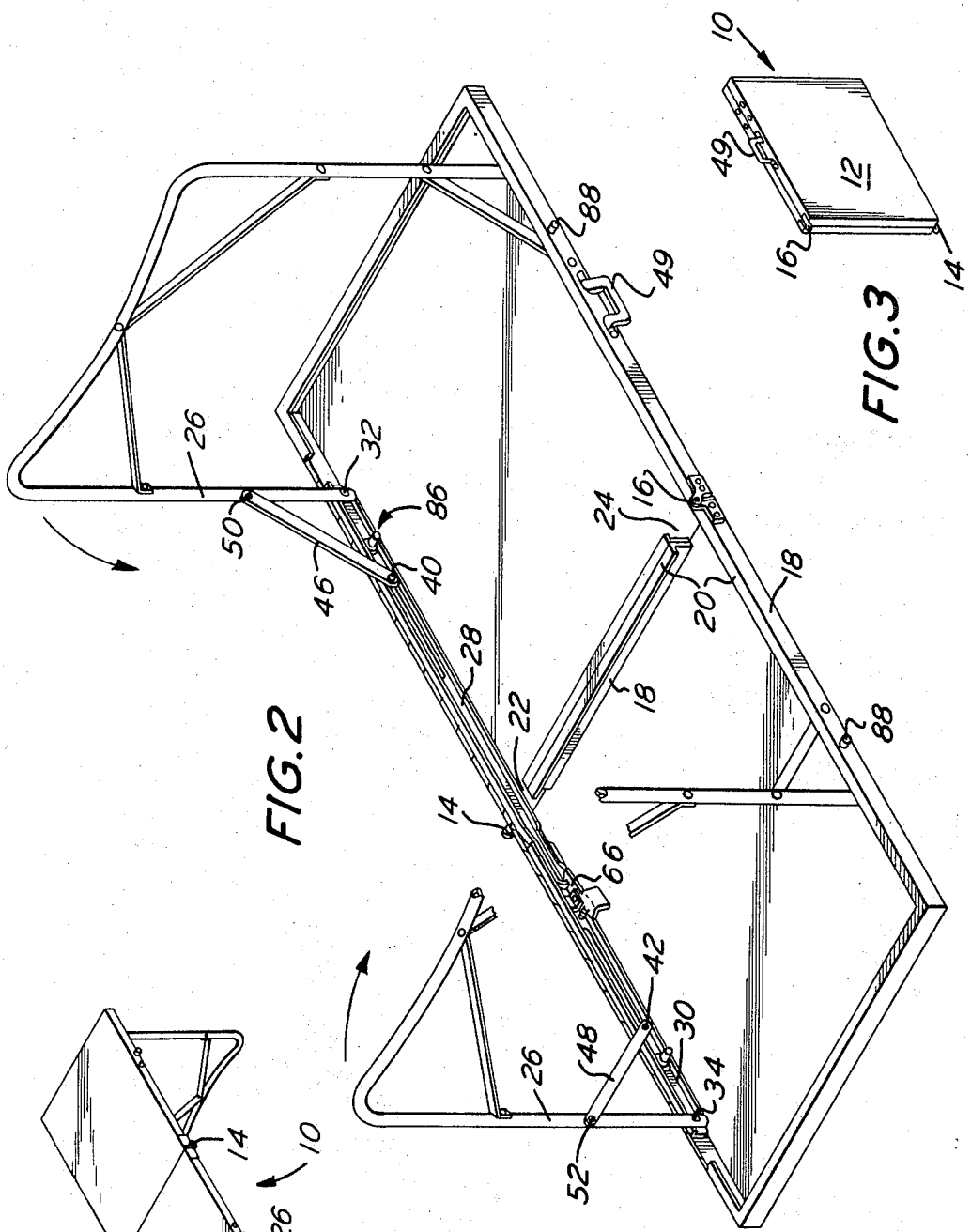


FIG. 3

FIG. 2

FIG. 1

INVENTOR
BORIS COHEN
BY Seidel & Gonda
ATTORNEYS.

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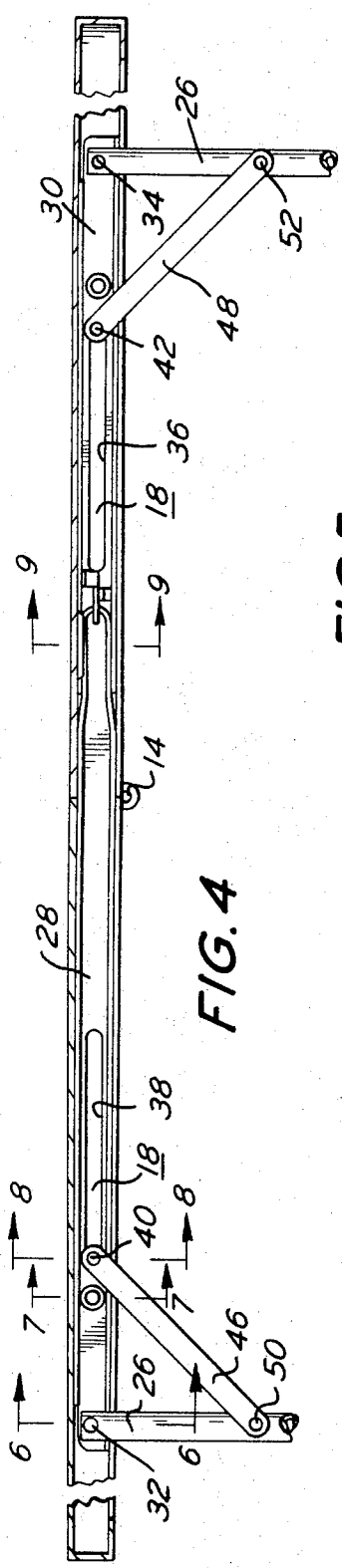


FIG. 4

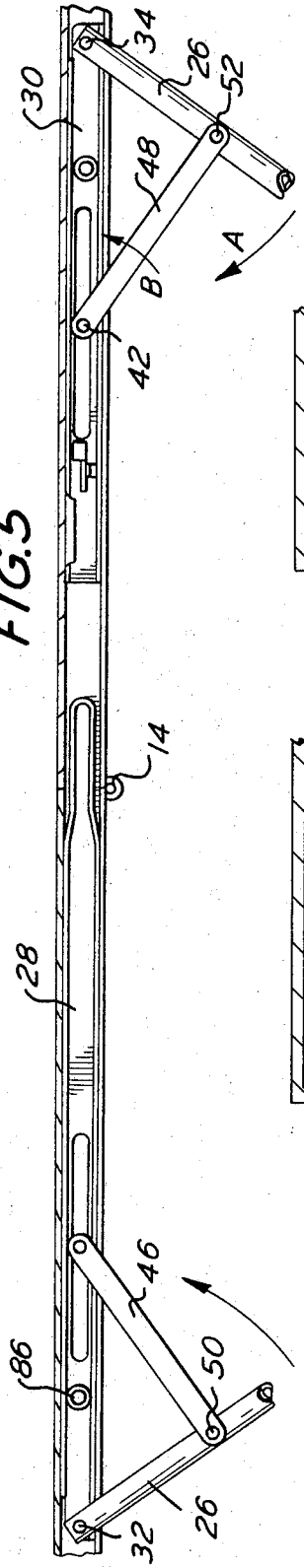


FIG. 5

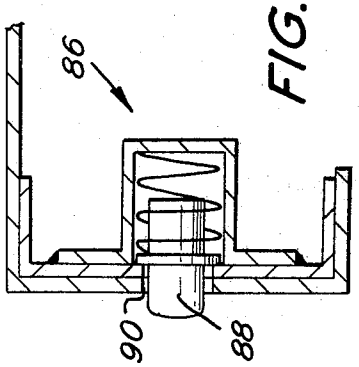


FIG. 7

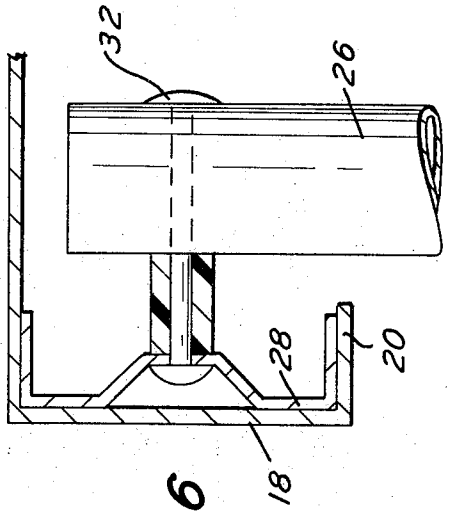


FIG. 6

INVENTOR
BORIS COHEN
BY Seidel & Gonda

ATTORNEYS.

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FIG. 8

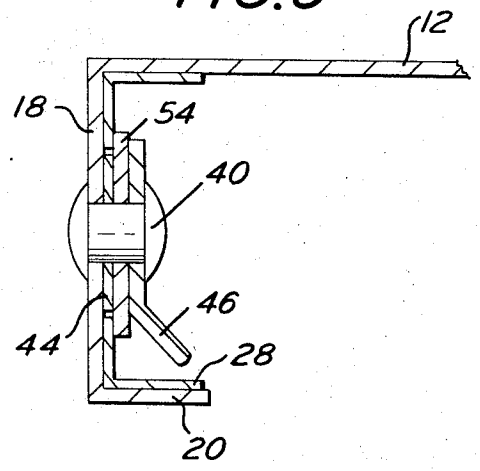
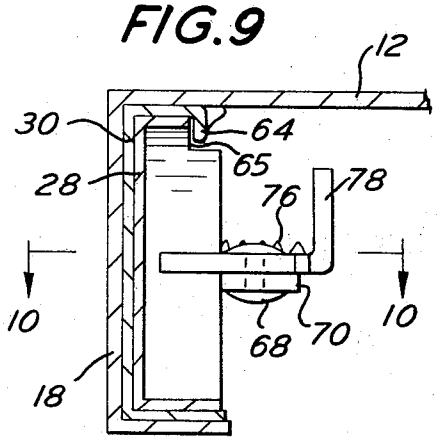


FIG. 9



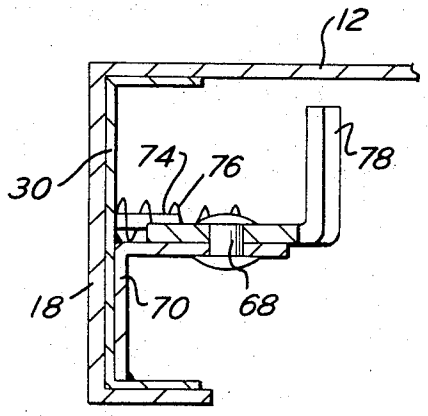


FIG. 11

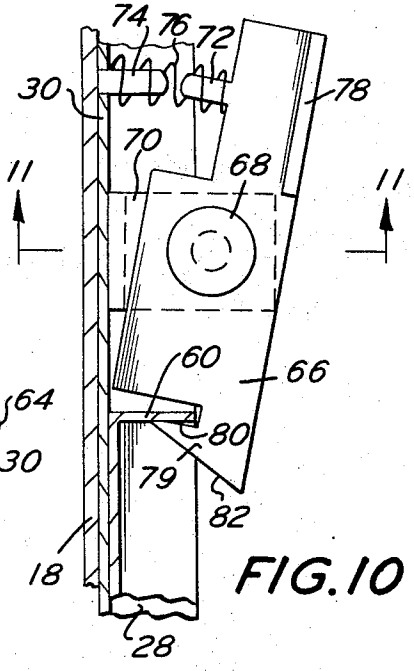
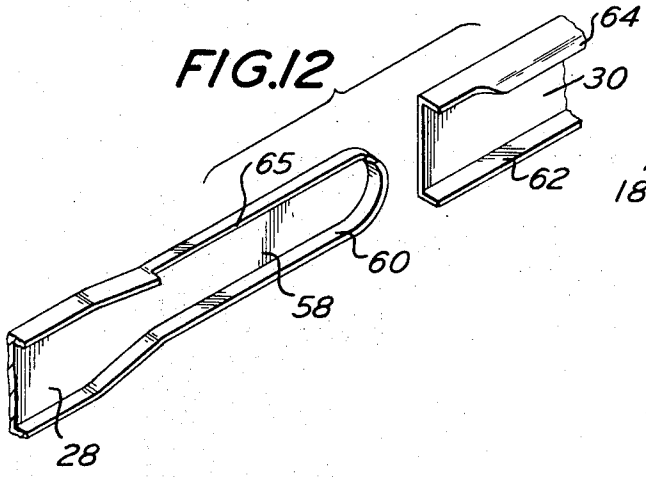


FIG. 10

FIG. 12



INVENTOR
BORIS COHEN
BY Sertel & Honda
ATTORNEYS.

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LOCKING MECHANISM FOR FOLDABLE TABLES

Boris Cohen, Merion Station, Pa., assignor to All-Luminum Products, Inc., Philadelphia, Pa., a corporation of Pennsylvania

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6 Claims. (Cl. 108—131)

ABSTRACT OF THE DISCLOSURE

An automatic locking mechanism for foldable tables having shiftable interengaging bracing members, comprising a latch member on one of the bracing members, an abutment member on the other of the bracing members, and a longitudinally extending flange on one of the bracing members overlying the other bracing member. The locking member and abutment prevent axial movement of the bracing members, and the flange maintains the bracing members in coplanlar relation.

This invention relates to locking mechanisms for folding tables, and more particularly, to locking mechanisms for automatically maintaining foldable tables in assembled table forming disposition.

Numerous types of folding tables are known to the prior art. Notable among these is the one disclosed in Patent 2,542,394, issued to Cohen et al., which is a foldable table having a pair of hinged top sections and supporting legs pivotably coupled to shiftable interengaging bracing elements. With the top sections in table-forming disposition, rotation of the legs to their supporting position serves to shift the bracing elements into interengaged position, whereby the bracing elements rigidify the structure and maintain the top sections in coplanar relationship.

The present invention is a novel and improved form of a locking mechanism whereby the legs of a foldable table of the type disclosed in Patent 2,542,394 may be automatically maintained in their supporting position, and the top sections rigidly maintained in coplanar relationship. The present invention contemplates an automatic locking mechanism directly interconnecting the bracing elements when the table is unfolded.

Accordingly, it is an object of the present invention to provide a novel automatic locking mechanism for folding tables of the type having shiftable interengaging bracing elements.

It is another object of the present invention to provide an automatic locking mechanism which provides a direct connection between shiftable bracing elements, each of which is associated with one of a pair of hingedly coupled table-top forming sections.

It is another object of this invention to provide a locking mechanism automatically operative upon unfolding of a foldable table, and easily released for folding.

It is yet another object of this invention to provide an automatic locking mechanism requiring an absolute minimum of moving parts.

It is still another object of the present invention to provide an automatic locking mechanism which serves to further rigidify foldable table structure with which it is used.

Other objects will appear hereinafter.

Locking mechanisms for foldable tables have heretofore been proposed, as for example, in Patent 2,643,926 to Pucci. The present invention provides a simpler, less expensive and more desirable construction by providing a direct and automatically engageable locking connection between the shiftable interengaging bracing members. Rigid interconnection of the bracing members, which extend across the axis about which the top sections fold, provides an extremely rigid construction, not likely to be affected by inadvertent impact, but nevertheless easily manipulated when folding is desired.

For the purpose of illustrating the invention, there is shown in the drawings a form which is presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

FIGURE 1 is a perspective view showing a table in accordance with the present invention in its open position.

FIGURE 2 is a perspective view showing the underside of the table when the table is in its open position.

FIGURE 3 is a perspective view of the table in its folded position.

FIGURE 4 is a longitudinal sectional view taken along the line 4—4 in FIGURE 1.

FIGURE 5 is a view similar to FIGURE 4 showing the legs in partially folded condition.

FIGURE 6 is a partial sectional view taken along the line 6—6 in FIGURE 4.

FIGURE 7 is a partial sectional view taken along the line 7—7 in FIGURE 4.

FIGURE 8 is a partial sectional view taken along the line 8—8 in FIGURE 4.

FIGURE 9 is a partial sectional view taken along the line 9—9 in FIGURE 4.

FIGURE 10 is a partial sectinoal view showing details of the automatic locking mechanism of the present invention.

FIGURE 11 is a sectional view taken along the line 11—11 in FIGURE 10.

FIGURE 12 is a perspective view showing details of the interengaging ends of the shiftable bracing members which form a part of the present invention.

Referring now to the drawings in detail, wherein like numerals indicate like elements, there is seen in FIGURE 1 a foldable table designated generally by the numeral 10. The table 10 has a planar top, formed by identical top members 12. The top members 12 are joined at an adjacent edge portion by hinges 14 and 16, best seen in FIGURE 2. The top members 12 are preferably formed of lightweight sheet metal. A down-turned flange 18 extends around the edge portions of the top members 12, and includes a further free edge portion 20, disposed in a direction generally parallel to the plane defined by the top members 12. The down-turned flanges 18 and free edge portions 20 define peripheral channels on the edges of the top members 12. Such channels serve to rigidify and strengthen the table, and form an important part of the mechanism facilitating folding of the table, as will shortly become apparent.

When the foldable table 10 is in its open position, the top members 12 are in coplanar edge-to-edge relation. The hinges 14 and 16 provide a common folding axis parallel to the abutting edges of the top members 12. The flanges 18 of the abutting edges of the top members 12 are cut away, as indicated at 22 and 24, so that the channels at the sides of the top members 12 are unobstructed for the full length of the table.

Each of the top members 12 is provided with a leg member 26, which may be of generally U-shaped configuration. The outer ends of the leg members 26 are pivotably attached to bracing members 28 and 30, for example, by pivots 32 and 34. The pivots 32 and 34 are at outer ends of the respective bracing members 28 and 30.

The bracing members 28 and 30 may be channel-shaped sheet metal members, and have exterior dimensions to provide a snug sliding fit in the channels defined by the down-turned flanges 18 and free edge portions 20 of the top members 12. Thus, the bracing members 28 and 30 are longitudinally shiftable along the channels.

As seen in FIGURE 2, the bracing member **28** is somewhat shorter in longitudinal dimension than the bracing member **30**. Bracing members **28** and **30** are provided on both sides of the table.

Referring now to FIGURES 2 and 4, it is seen that the bracing members **28** and **30** include elongated slots **36** and **38** in the portions thereof adjacent the down-turned flanges **18**. Pivot pins **40** and **42**, secured to the down-turned flanges **18**, extend through the elongated slots **36** and **38**. As is best seen in FIGURE 8, bearing washers **44** may be provided on the pivot pins **40** and **42** for engagement with the edges of the slots **36** and **38**. Thus, the pivot pins **40** and **42** extend through the elongated slots **36** and **38**, but do not interfere with shifting of the bracing members **28** and **30**. Links **46** and **48** are pivoted at one end to the pivot pins **40** and **42**, and at their other ends to the leg members **26**, for example, at pivots **50** and **52** spaced from the pivots **32** and **34**. Retainer washers **54** may be provided between the links **46** and **48** and the bracing members **28** and **30**, thereby further enhancing relative movement of the parts.

Referring to FIGURE 5, the manner in which legs **26** move to their folded positions should now be apparent. Referring to the leg **26** at the right-hand side of the figure, folding is initiated by rotation of the legs in the direction indicated by the arrow A. Such rotation occurs about the pivot **52**. The pivot **52**, however, itself rotates in the direction B, about the pivot **42**. The bracing member **30**, therefore shifts to the right in the figure, the slot **36** permitting longitudinal movement with respect to the pivot pin **42**. Upon completion of rotation, the legs **26** are positioned between opposite flanges **18**. The flanges **18** have a vertical dimension sufficient to fully enclose the legs and associated structure when the table is closed, as in FIGURE 3. The table **10** may be provided with a handle **49** for ease of carrying.

There are seen in FIGURES 9 to 12 details of structure constituting the applicant's novel automatic locking mechanism. Referring first to FIGURE 12, the bracing member **28** includes a forward tip **58** of reduced vertical dimension. The forward tip **58** of the bracing member **28** may be received in nesting relation within the channel defined by the forward end of the bracing member **30**. The bracing members, it should be understood, include peripheral flanges **60** and **62** extending generally at right angles to the vertical dimensions of the bracing members. The peripheral flange **62** of the bracing member **30** is provided with a down-turned longitudinally extending free edge portion **64**. The free edge portion **64** overlies a finished edge portion **65** of the flange **60** of the bracing member **28** when the bracing members are in their nested position, and serves to maintain the bracing members in generally coaxial nested relation.

Referring to FIGURE 10, there is seen a latch member **66**, pivotably coupled to the bracing member **30** by a pivot pin **68**, secured to upstanding bracket **70**. The latch member **66** is provided with an anchor member **72**, and the bracing member **28** with a similar anchor member **74**. A compression spring **76** has its opposite ends disposed on the anchor members **72** and **74**, and serves to bias the latch member to a locking position. The latch member **66** includes a pressure applying surface **78**, whereby pressure may be applied to rotate the latch member against the bias of the spring **76** for a purpose to be explained hereinafter. The latching member **66** also includes a locking tooth **79** including a locking surface **80** and a beveled cam surface **82** adjacent the locking surface **80**. The forward tip of the peripheral flange **60** of the bracing member **28** provides an abutment, engageable with the locking surface **80** to prevent relative longitudinal shifting of the bracing members **28** and **30**.

It should now be apparent that the spring **76** serves to bias the latch member into a position wherein the locking surface **80** contacts the tip of the peripheral flange **60**. It should also be apparent that upon unfolding of the leg members **26**, initial contact between the tip of the peripheral flange **60** and the cam surface **82** is effective to momentarily rotate the latch member **66** against the bias of the spring **76**, thereby permitting the tooth **79** to ride over the tip of the peripheral flange **60**. Immediately thereafter, the spring **76** causes the latch member **66** to rotate to a position wherein the locking surface **80** engages the rear surface of the tip of the peripheral flange **60**. Such engagement prevents separation of the bracing members **28** and **30** until such time as pressure is intentionally applied to the pressure applying surface **78** to rotate the tooth **79** away from the peripheral flange **60**.

If desired, the bracing members **28** and **30** may be provided with spring projected bullet locks **86** as a back-up against inadvertent collapsing of the table. The bullet locks **86** best seen in FIGURE 7, include projections **88** for engagement with openings **90** in the down-turned flanges **18**. It has been found, however, that satisfactory performance can be had without the use of the bullet locks **86**.

As is apparent from FIGURES 2, 4 and 5, unfolding of the leg members **26** is effective to project the bracing member **28** across the folding axis defined by the hinges **14** and **16**. The down-turned free edge portion **64**, in contact with the finished edge portion **65** of the bracing member **28**, and the latch **66** in contact with the flange **60** unite the bracing members **28** and **30** to form in effect a single highly rigid structural member, extending across the hinge line. Thus, the novel automatic lock effectively precludes rotation about the hinges **14** and **16**. Moreover, the novel lock may be readily disengaged by the application of pressure on the pressure applying surface **78**, but due to the protected location of the latch **66**, best seen in FIGURE 11, cannot be inadvertently released by impact or snagging.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

I claim:

1. In a foldable table having at least one pair of longitudinally shiftable interengaging bracing members underlying and supporting a pair of hingedly connected top members, one of said bracing members having a forward tip of reduced vertical dimension adapted to be received in nesting relation with the forward end of the other of said bracing members; manually releasable means for automatically locking said bracing members in interengaged top bracing position, said locking means comprising a latch member on one of said bracing members, an abutment on the other of said bracing members for engagement with said latch member, and a longitudinally extending flange on the other of said bracing members overlying a portion of the forward tip of said one bracing member for returning said one bracing member in generally coaxial nesting relation with said other bracing member.

2. In a foldable table in accordance with claim **1**, said forward tip including an upstanding peripheral flange, said abutment comprising a portion of said upstanding flange, said longitudinally extending flange overlying a further portion of said upstanding flange when said bracing members are in top-bracing position.

3. In a foldable table in accordance with claim **1**, said further portion of said upstanding flange comprising a finished surface for engagement with said longitudinally extending flange when said bracing members are in top-bracing position.

4. In a foldable table in accordance with claim **3**, said manually releasable means comprising a pivotable latch member, a locking surface on said latch member for engaging said upstanding flange, and spring means coupled to said latch member normally urging said latch member to a locking position.

5. In a foldable table in accordance with claim 4, said latch member including a cam surface for initial engagement with said upstanding flange, said cam surface being adjacent said locking surface so that shifting of said bracing members toward the top-bracing position causes automatic engagement of said locking surface and said upstanding flange.

6. In a foldable table in accordance with claim 4, said latch member including a pressure applying surface whereby said latch member may be rotated to release said locking surface from said upstanding flange, and said bracing members being of channel-shaped cross-section, said latch member being disposed within said channel.

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CASMIR A. NUNBERG, *Primary Examiner.*

GLENN O. FINCH, *Assistant Examiner.*