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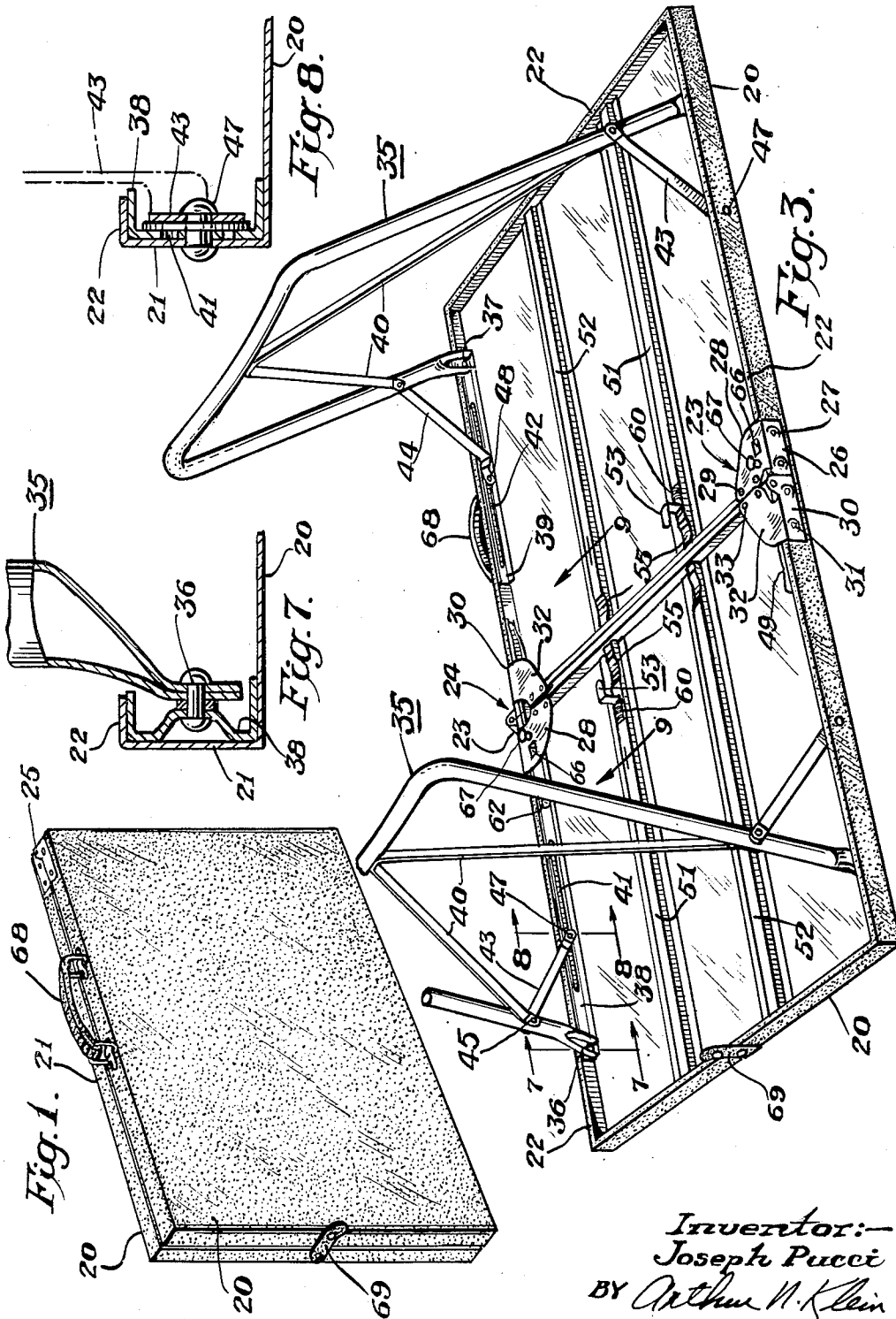
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2,643,926

FOLDABLE TABLE WITH AUTOMATIC LOCKING MECHANISM

Filed Oct. 25, 1951

3 Sheets-Sheet 1



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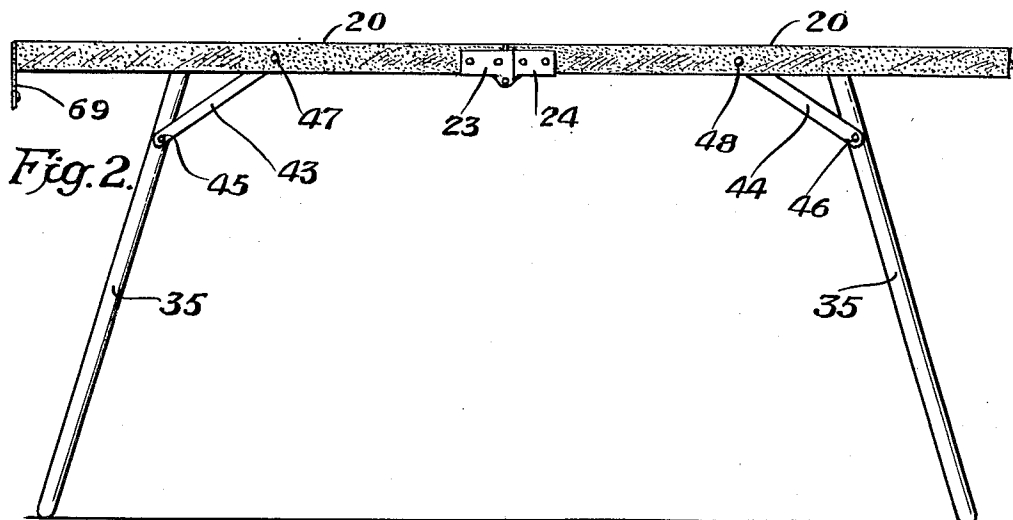
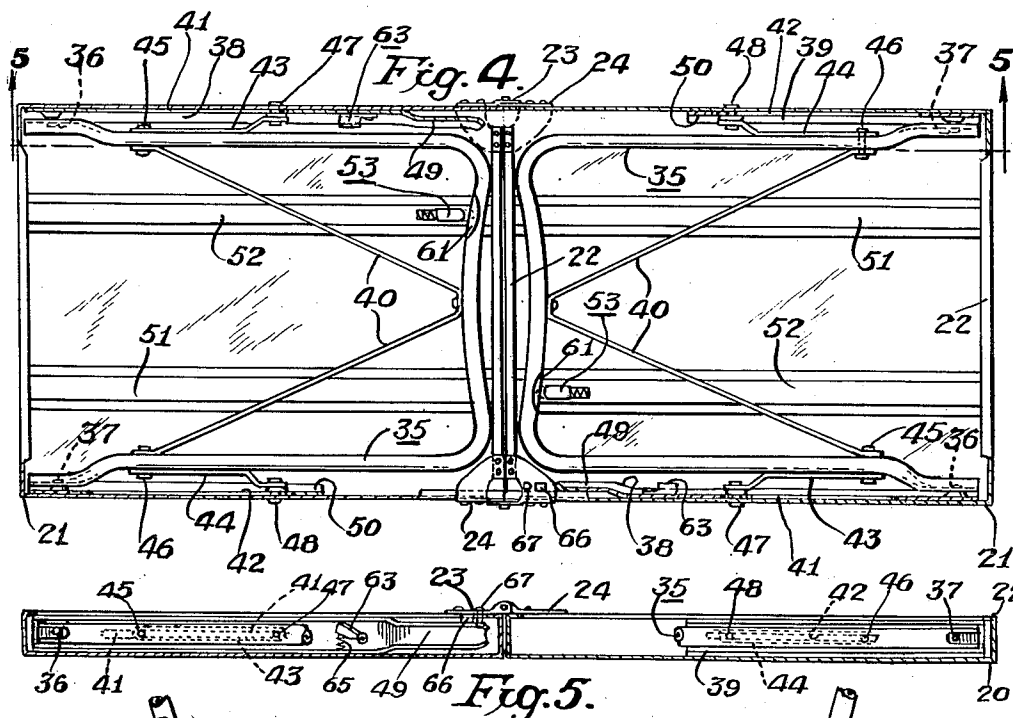
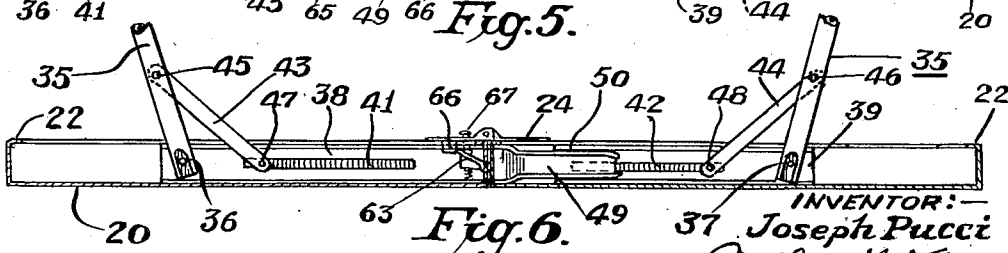
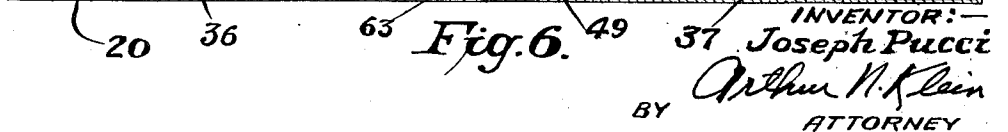
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3 Sheets-Sheet 2



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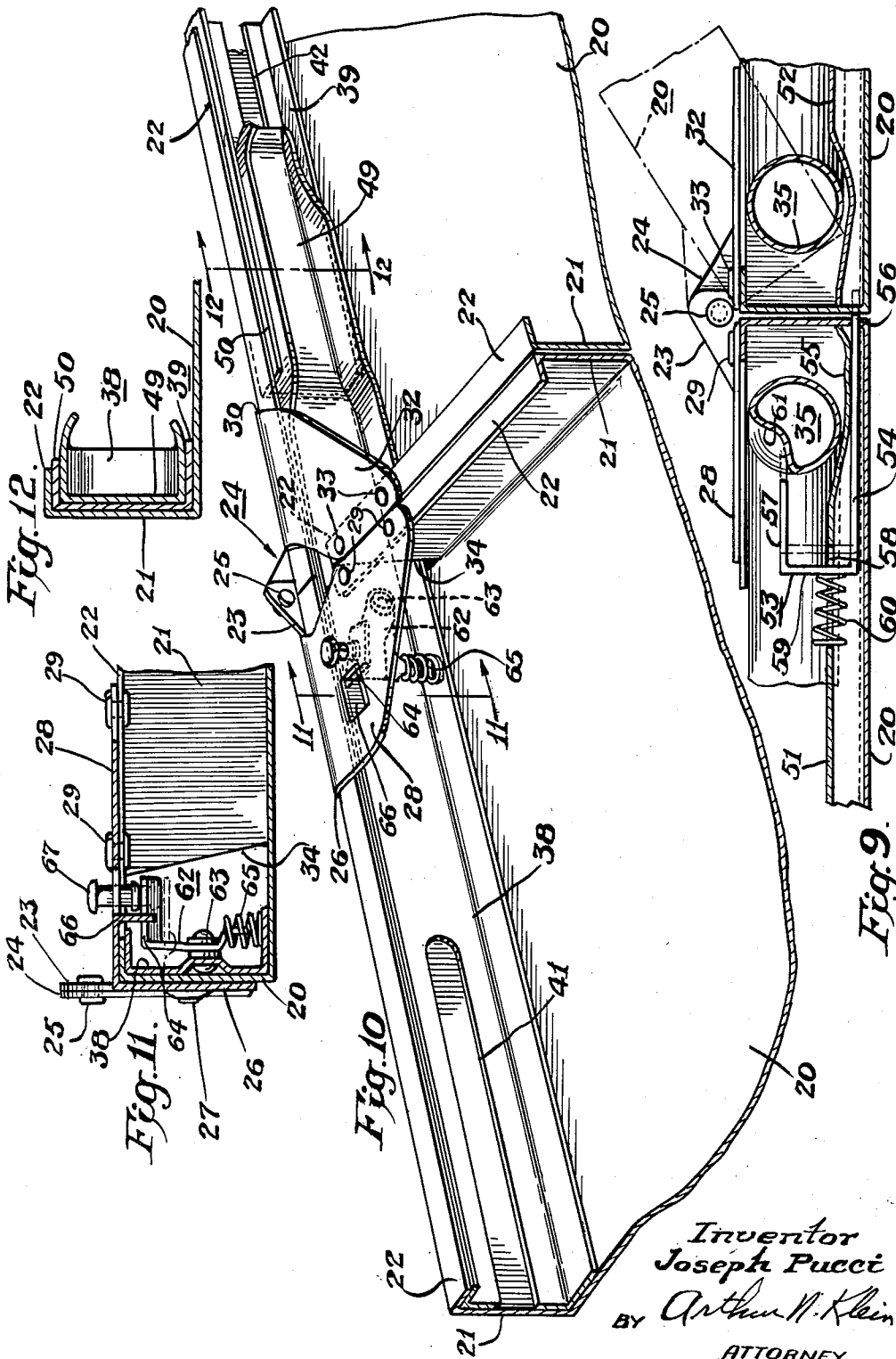
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FOLDABLE TABLE WITH AUTOMATIC LOCKING MECHANISM

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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

2,643,926

FOLDABLE TABLE WITH AUTOMATIC
LOCKING MECHANISM

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5 Claims. (Cl. 311-90)

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The present invention relates generally to foldable tables and it relates more particularly to foldable tables of the type disclosed in Patent 2,542,394.

An object of the present invention is to provide a new and improved foldable table, of metal or the like, which is strong and durable and provides a relatively large top-surface, rigidly braced against collapse when opened, and which can be quickly and easily folded into a relatively small, compact, light-weight unit, having its supporting legs fully enclosed and concealed, whereby the folded unit can be conveniently stored in a small space and can be easily carried from place to place by one person.

Another object of the present invention is to provide a foldable table of the type disclosed in Patent 2,542,394; namely a foldable table having a pair of hinged top-sections and having supporting legs operatively associated with relatively shiftable interengaging bracing elements, so that, with the top-sections in open co-planar relationship, movement of the legs to open supporting position will automatically shift the bracing elements into interengaged position wherein they rigidly maintain the top-sections in co-planar relationship and also lock the legs in supporting position; but having improved locking and releasing mechanism for the bracing elements and legs.

Still another object of the present invention is to provide a foldable table of the type described in the foregoing paragraph, but having positive locking mechanism which will eliminate accidental collapse of the table resulting from inadvertent kicking or pushing of the supporting legs.

Other objects and advantages of the present invention will be apparent in the following detailed description, appended claims and accompanying drawings.

In Patent 2,542,394, there is disclosed a foldable table which has proven extremely effective and highly successful in providing a relatively large, rigid top-surface when opened, and in permitting quick and easy collapse into a relatively small, compact, enclosed, light-weight unit, which can be conveniently stored and easily carried from place to place.

It has now been found that an even more efficient and desirable construction results when new and improved locking mechanism is operatively associated with the relatively shiftable interengaging leg-bracing elements of the table so as automatically to provide a positive

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lock against inadvertent collapse of the legs, while permitting ready release of the elements and legs when it is desired to close the table. It has also been found that, by modifying the structure of the leg-bracing elements, they can be considerably strengthened, and the danger of buckling or jamming during interengaging shifting thereof can be minimized.

For the purpose of illustrating the invention, one form thereof, which has been found in practice to give satisfactory results and which is presently preferred, is shown and described herein, it being understood, however, that the invention is not limited to the precise arrangements and instrumentalities disclosed.

Referring to the accompanying drawings, in which like reference characters indicate like parts throughout:

Figure 1 is a perspective view of the table of the present invention, as it appears when closed.

Figure 2 is a side elevational view showing the table in open position.

Figure 3 is a perspective view of the underside of the table, showing the top-sections in open co-planar position and showing the legs and bracing elements intermediate their open and closed positions.

Figure 4 is a bottom plan view of the table, showing the top-sections in open co-planar position and the legs in collapsed or closed position.

Figure 5 is a cross-sectional view generally along the line 5-5 of Fig. 4.

Figure 6 is a cross-sectional view like that of Fig. 5, but showing the position of the parts with the legs open and the bracing elements interengaged.

Figure 7 is an enlarged cross-sectional view generally along the line 7-7 of Fig. 3.

Figure 8 is an enlarged cross-sectional view generally along the line 8-8 of Fig. 3.

Figure 9 is an enlarged cross-sectional view generally along the line 9-9 of Fig. 3.

Figure 10 is an enlarged fragmentary perspective view of the underside of the table, showing the bracing elements in interengaged, locked position.

Figure 11 is a cross-sectional view generally along the line 11-11 of Fig. 10.

Figure 12 is a cross-sectional view generally along the line 12-12 of Fig. 10.

Referring now to the embodiment shown generally in Figs. 1-4, it can be seen that the foldable table of the present invention has a top which is formed by a pair of identical sections

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20, 20. Each of the top sections 20 is formed of light-weight sheet-metal or the like, which may be rectangular in configuration. Each top section 20 is provided with an integrally-formed depending flange 21 extending along all four sides thereof and having an inturned free edge 22, thereby providing a peripheral channel, of generally C-shaped cross-section, along the underside of each top section.

The top sections 20, 20 are foldably connected in end-to-end co-planar relationship by hinge units disposed at adjoining corners thereof. Each hinge unit is made up of coacting hinge-elements 23 and 24 pivotally connected by a hinge-pin 25. The hinge-element 23 includes a generally vertical portion 26 which is secured to the outside of the side flange 21 by a pair of rivets 27 or the like. The hinge-element 23 also includes an integrally-formed horizontal portion 28, of more or less triangular contour, which underlies the inturned free edge 22 of the side flange and also the inturned free edge 22 of the end flange, to which it is secured by a pair of spaced rivets 29, as shown particularly in Fig. 10. Similarly, the hinge-element 24 has a vertical portion 30 secured to the outside of the side flange by rivets 31 and a more or less triangular horizontal portion 32 secured to the inturned free edge 22 of the end flange by spaced rivets 33.

As indicated in Fig. 10, the adjoining end flanges carrying the hinge-element portions 28 and 32 are cut, at 34, short of the side flanges to provide an uninterrupted passageway between the side channels of the co-planar, end-to-end top sections.

The vertical dimension of each flange 21 is sufficient to enclose the folded legs and associated bracing elements to be hereinafter described, and fully to conceal them when the table is closed, as shown in Fig. 1.

Each of the top sections is provided with a tubular leg-member 35 of generally U-shaped configuration, having its free ends hingedly connected, as at 36 and 37, to the outer ends of bracing-members 38 and 39 respectively, in the manner indicated in Fig. 7. Each U-shaped leg-member 35 is provided with a generally V-shaped reinforcing-element 40, as shown particularly in Fig. 4.

The bracing-members 38 and 39 are generally U-shaped in cross-section and fit snugly within the C-shaped side channels of the top section, being longitudinally shiftable therealong. The bracing-member 38 is somewhat longer than the bracing-member 39 and, on each top section, is disposed within the side channel carrying the hinge-element 23, while the shorter bracing-member 39 is disposed within the side channel carrying the hinge-element 24. Thus, on each side of the opened table, a bracing-member 38 and a bracing-member 39 extend toward each other within the communicating side channels.

Each of the bracing-members 38 is provided with a longitudinal slot 41, while a similar slot 42 is provided on each bracing-member 39.

A pair of links 43 and 44 are pivotally connected, as at 45 and 46 respectively, to the sides of each leg-member 35 at points somewhat spaced from the connections 36 and 37. The other ends of the links are pivotally connected to the depending side flanges 21 by headed rivets 47 and 48 respectively which project through the slots 41 and 42 without interfering with the longitudinal movement of the bracing-members 38

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and 39, the rivets being provided with spacing washers, as indicated in Fig. 8.

When the table is not in use, each of the U-shaped leg-members 35 is disposed in a plane closely adjacent and generally parallel to the main surface of the top section, as indicated in Fig. 4. In this position, the links 43 and 44 generally parallel the bracing-members 38 and 39 which are in their outermost retracted positions, each being fully within its top section.

However, when the leg-members 35 are manually swung to vertical supporting position relative to the open, co-planar top sections, as indicated in Fig. 3, the links 43 and 44 are moved to inclined position and the bracing-members 38 and 39 are shifted longitudinally toward each other, and the forward or inner ends 49 of the longer bracing-members 38 then protrude beyond the center fold line of the table top and into the opposite top section. The forward end 49 is reduced in vertical dimension and provided with a rounded tip, whereby it can move smoothly into nested relationship within the forward end 50 of the shorter bracing member 39, as indicated in Figs. 6, 10 and 12, when the leg-members are in their normal supporting position, wherein the links 43 and 44 further serve to brace the leg-members. The provision of the reduced, rounded front or forward end on each longer bracing-member 38 has been found to be of particular importance, since otherwise there may be a tendency for the ends of the bracing-members to strike each other and to be bent or otherwise damaged during opening of the table.

It is apparent that, when the leg-members are oppositely swung to closed, folded position, as indicated in Figs. 4 and 5, the bracing-members are oppositely shifted to retracted position, enabling the top sections to be swung about the hinge units to the folded, closed position of Fig. 1.

In other words, movement of the leg-members to supporting position automatically locks the co-planar top sections to form a more or less continuous, rigid table top, while opposite movement of the leg-members to collapsed position automatically frees the top sections to permit folding of the table to closed position.

A pair of hollow stiffening ribs 51 and 52 are fastened to the underside of each top section, generally parallel to the sides thereof. As indicated in Figs. 3 and 9, the rib 51 is provided with a safety locking device which prevents opening of the leg-members or movement of the bracing-members unless and until the top sections are in their proper co-planar relationship, with the side channels fully aligned; it being obvious that an attempt to force the bracing-members 38 to extended position when the channels are not properly aligned would cause damage to either the forward end 49 or the channel or both.

The safety locking device includes a J-shaped member 53, the longer arm 54 of which extends longitudinally within the somewhat flattened end 55 of the hollow rib 51 and in line with a slot 56 formed in the inner end flange 21. The shorter arm 57 of the J-shaped member 53 is disposed outside the rib 51 which has an elongated opening 58 through which the intermediate arm 59 of the member 53 extends. A helical spring 60 is disposed within the rib 51 and bears against the intermediate arm 59 to urge the member 53 toward the inner end flange 21 (to the right in Fig. 9). When the two top sec-

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tions are in co-planar relationship, the slot 56 is closed by the adjoining inner end flange 21 of the other top section, so that the J-shaped member 53 is maintained in the position shown in solid lines in Fig. 9, wherein the shorter arm 57 terminates short of the intermediate foot portion 61 of the U-shaped leg-member 35, so that the leg-member can be moved to open position and the bracing-members shifted within the side channels, with the longer bracing-members 38 moving into the aligned side channels of the opposite top sections in the manner described above.

However, when the two top sections are not in fully co-planar relationship, as indicated in dash-dot lines in Fig. 9, the slot 56 is no longer closed by the adjoining inner end flange 21, and the J-shaped member 53 is free to move, under the action of the spring 60, until the intermediate arm 59 contacts the end wall of the opening 58, in which position the longer arm 54 protrudes somewhat beyond the slot 56 and the shorter arm 57 overlies the intermediate foot portion 61 of the leg-member 35 and prevents it from being moved from its position against the flattened end 55 of the rib 51. In other words, it is impossible to move the leg-members and the bracing-members unless the adjoining inner end flanges 21 are side-by-side, which can only occur when the two top sections are in co-planar relationship and the side channels thereof are in alignment, to permit movement of the longer bracing-members from one channel into the other.

It is apparent that, when the top sections are swung from the non-aligned (dash-dot) position to the co-planar (solid-line) position of Fig. 9, the protruding end of the longer arm 54 will be forced inward by the adjoining inner end flange of the other top section, to shift the member 53 back to its original position, freeing the intermediate foot portion 61.

Coming now to the locking mechanism for the bracing-members, I provide each of the longer bracing-members 38 with a locking-member 62, which is pivotally mounted as at 63 within the U-shaped cross-section of the bracing-member 38, somewhat inward of the reduced forward end 49, as shown particularly in Figs. 10 and 11. The locking-member 62 has an uppermost rearwardly or inwardly directed locking-shoulder 64, the locking-member and locking-shoulder being urged to uppermost position by a spring 65.

A downwardly-directed stop 66 is struck out of the horizontal portion 28 of the hinge-element 23, in line with the locking-shoulder 64, which, as shown in Fig. 11, extends horizontally somewhat beyond the U-shaped cross-section of the bracing-member 38. The portion 28 of the hinge-element 23 is also provided with a release-button 67 which contacts the locking-shoulder 64 and, when pushed, is capable of shifting the locking-shoulder and locking-member 62 against the pressure of the spring 65, sufficiently to enable the locking-shoulder to clear the stop 66, as indicated in dash-dot lines in Fig. 11.

As the longer bracing-member 38 moves toward engaging position (to the right in Fig. 10), the spring-urged locking-member 62 is momentarily depressed by the forward edge of the stop 66, and then springs up to the locking position shown in solid lines in Fig. 11, wherein the bracing-members are in the engaged position shown in Fig. 10, so as to prevent return, un-

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locking movement of the bracing-members, regardless of pressure exerted on the leg-members.

However, when the release-button 67 is pushed, the locking-shoulder 64 is moved out of alignment with the stop 66, so that the longer bracing-member 38 is free to slide back to its retracted position when the leg-members are manually collapsed, to enable the top sections to be folded to the closed position of Fig. 1.

For ease of carrying, a handle 68 may be attached to the outside of one of the side flanges, while a conventional snap-type fastening unit 69 may be provided detachable connection of the two outer end flanges, which are in adjoining position when the table is closed as shown in Fig. 1.

While it is presently preferred to construct the entire table of light-weight metal alloys of relatively great structural strength, it is possible to employ wood or other suitable material for the top surfaces in cases of metal shortages or where appearance is more important than light-weight.

When opened, the novel table of the present invention is capable of seating six to twelve or even more persons comfortably, depending on its size, providing a rigid and secure table surface. At the same time, it can be closed, in a matter of a few seconds, to a small, virtually two-dimensional, compact and light-weight unit, which can be conveniently carried and stored, with the leg-members fully enclosed and concealed.

The present invention may be embodied in other forms and, accordingly, the foregoing embodiment is to be considered merely as illustrative and not restrictive, reference being made to the appended claims, rather than to the preceding description, as indicating the scope of the invention.

Having thus described my invention, I claim as new and desire to protect by Letters Patent:

1. For use in a foldable table having a longitudinally shiftable elongated bracing-member for underlying and supporting a pair of hingedly-connected top sections; manually-releasable means for automatically locking said bracing-member in extended top-bracing position, said locking means comprising a vertically disposed stop mounted on the underside of one of the top sections adjoining the bracing-member, a locking member movably mounted on the bracing-member and provided with means normally urging it to locking position, said locking-member having a horizontally-disposed locking-shoulder normally disposed in a plane intersecting the plane of the stop, said locking-member momentarily contacting, and being forced inward by, the stop just prior to the end of the outward longitudinal top-bracing movement of the bracing-member and thereafter springing outward to locking position with the locking-shoulder disposed behind the stop, and a manually-operable release-button mounted adjacent said stop and designed to force the locking-member inward and clear of the stop so as to permit top-freeing return movement of the bracing-member.

2. A construction according to claim 1 wherein the locking-member is pivotally mounted on the bracing-member and is provided with a spring normally urging it to extended locking position.

3. A construction according to claim 2 wherein the bracing-member is generally U-shaped in cross-section with the locking-member and the spring disposed generally therewithin but with the locking-shoulder protruding laterally

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somewhat therebeyond and wherein the stop is disposed laterally of the bracing-member in position to be engaged by the laterally-protruding portion of the locking-shoulder.

4. A construction according to claim 3 wherein the stop and the release-button are mounted on one of the hinges connecting the top sections.

5. A construction according to claim 4 wherein the stop is formed integrally with, and is struck out vertically from, one of the hinge-elements.

JOSEPH PUCCI.

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